Growth, Institutional Challenges and the Political Settlement in Bangladesh

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Abstract: This paper builds on the analysis of the political settlement in Bangladesh in a companion paper entitled 'The Political Settlement and its Evolution in Bangladesh'.

We look at three critical sectors in contemporary Bangladesh, two of which were subject to significant learning-by-doing problems whose resolution was significantly affected by characteristics of the political settlement and the third where long-term investment faces institutional problems related to the political settlement. The first is the most successful sector in Bangladesh: its garments industry. This sector emerged during the clientelistic authoritarian period of the 1980s and benefited from the MFA that provided Bangladesh with 'quota rents' for a short time. The characteristics of the political settlement of the time allowed critical institutional innovations and the structure of the 'financing' for learning created strong incentives and compulsions for high levels of effort. This is a very useful case for understanding the importance of effective institutional solutions for financing learning-by-doing even in a low-technology sector. As the political settlement evolved, sustaining technological upgrading in the sector has become more difficult though it is happening at the level of individual firms. Second, we look at the electronics sector whose takeoff in the 2000s took place under a competitive clientelist political settlement. The external support provided to the sector was much less significant and the takeoff depended on the leading role played by a nationalist enterprise that absorbed the risks of investing in learning-by-doing. This example is interesting because despite the competitive clientelist political settlement, the government was compelled to play a follower role and policy evolved to support the sector. Nevertheless, progress was slower compared to garments. More can be done to support this sector by supporting specialization in components manufacturing and developing institutional support mechanisms that are compatible with the contemporary political settlement. Our final sector is the power generation sector. Poor power generation has seriously constrained development in the rest of the economy but successive governments have failed to raise power supplies in cost-effective ways. The problem here is not learning-by-doing but adverse incentives for investment that can be traced to the combined effects of the political settlement and an excessive reliance on private sector financing. This combination has resulted in adverse incentives that resulted in only a few politically connected players bidding and a focus on 'procurement rents' rather than production. Conventional reform strategies focusing on transparency, rule of law reforms and anti-corruption have not achieved results. Our analysis locates the institutional problems in the context of a specific political settlement and helps to explain both why conventional strategies have failed and also helps to identify alternatives that may fare better. In particular, the Indian experience suggests that a strategy of focusing on a long-term financing agency with a dedicated governance structure can change incentives sufficiently to enable improvements in power generation to be achieved even in the context of a competitive clientelist political settlement.

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Contents

Figures

Tables

1. Introduction

This chapter examines the challenges facing important growth sectors in Bangladesh in the context of our analysis of the evolution of the political settlement in that country. Attracting investment into growth sectors in developing countries requires overcoming market failures whose type and severity are different from those relevant for advanced countries. The very weakness of governance and institutions that characterizes what we describe as the clientelist political settlement implies that a range of market failures are likely to be endemic. The types of institutional solutions that are likely to be effective in solving particular market failures depends on the characteristics of the political settlement in that country and its evolution over time because the latter determines how effectively different types of institutions can be enforced, the types of informal modifications in these institutions that are likely and the contestation that particular institutional solutions will face from powerful organizations in society. In addition, we expect that the institutional solutions that will work will vary across sectors and over time in the same country because the relevant organizations and their relative power vary along these dimensions.

We focus on three major sectors in Bangladesh spanning three decades of development. This enables us to look at a number of different types of market failures and how variations in the political settlement over time allowed or obstructed particular types of solutions to these market failures. In analysing these market failures we draw on our earlier work on political settlements and technology acquisition (Khan 2009, 2010). We also draw on our analysis of the evolution of political settlement in Bangladesh in a companion piece to this work[1]. The first sector we look at has emerged as the most important sector in Bangladesh's recent economic development, the garments and textiles sector. Today this sector alone accounts for three-quarters of Bangladesh's export earnings and provides employment to well over three million workers. Bangladesh has a large low-wage workforce and the takeoff in the garments sector happened in the 1980s shortly after the statist planning of the early 1970s was abandoned. This lends credence to the argument that market forces and gradual liberalization led the growth of this sector.

Liberalization and the abandonment of a perverse type of 'socialism' during the dominant party political settlement of 1972-75 were indeed necessary for the garments sector takeoff but they were by no means sufficient. Even in a low-technology sector like garments, the workers, supervisors and entrepreneurs of the country lacked the know-how and tacit knowledge of production processes to set up globally competitive factories. This was despite the fact that investible funds were available in the hands of many potential investors after the massive 'primitive accumulation' of the post-independence years. The technology acquisition necessary for the takeoff was enabled by a number of specific institutional arrangements that allowed critical market failures constraining learning-by-doing to be overcome in this sector. The relatively successful implementation of these institutional solutions in the 1980s depended on a number of characteristics of the political settlement of that time which we have described as clientelistic authoritarianism as the country came out of the uncertainty and violence of the immediate post-independence years. The

[1] *The Political Settlement and its Evolution in Bangladesh*, companion paper presented to DIIS, December 2011.

characteristics of this political settlement allowed the garments sector to exploit to the full the temporary advantage that was offered to least developed countries like Bangladesh by the Multi-Fibre Arrangement (MFA), which provided Bangladesh with effective temporary rents that assisted the start-up investments in the new sector.

The garments industry is extremely important not just because of its current size and significance in the Bangladesh economy but also because it demonstrates the types of institutional strategies that can overcome critical market failures constraining technology acquisition and growth in developing countries. The solution that the garments industry enjoyed was not replicated in any other major sector for a number of reasons. First, a critical component of the institutional solution involved a fortuitous rent created by a global institutional arrangement, the MFA. The terms on which this rent was available for investors was, for serendipitous reasons, very effective in inducing high levels of effort on the part of firms investing in learning-by-doing. While the particular details of this arrangement were not designed by anyone, the reasons why this particular institutional structure creating incentives and opportunities worked so well has enormous significance for designing institutions for supporting learning-by-doing in the future. Secondly, clientelistic authoritarianism during the early phases of the sector's takeoff allowed the rapid solution of a number of additional institutional constraints facing the sector. Other sectors did not enjoy the exogenous rents created by the MFA for the garments sector, and by the mid-1980s, clientelistic authoritarianism was in crisis, to be replaced by a vulnerable democracy in 1991 that still describes the political settlement in contemporary Bangladesh.

The two other sectors we look at are the power generation sector and electronics, both as they operated in the democratic period in the 2000s. The period that we describe as vulnerable democracy was characterized by more intense competition between political organizations and a failure to evolve institutions that could maintain stability in the political domain. The instability and vulnerability that this caused seriously constrained the evolution of solutions to market failures in other potentially competitive sectors in the economy. The power generation sector has not been successful in organizing the long-term investments that are required for supporting the rapid expansion that the country needs. Bangladesh has one of the lowest per capita electricity generation figures in the world, and apart from the failure to provide power to the large rural population, power scarcities have created very serious constraints for the expansion of other sectors of the economy. The political settlement is directly implicated in the problems facing the sector. Standard explanations for failures in this sector have focused on the lack of transparency and good governance, and the presence of corruption and insider dealings. All of these are accurate descriptions of the sector, but they are characteristic features of all sectors in Bangladesh, and indeed of the power sector in neighbouring countries like India which have performed much better in power generation. The constraints in Bangladesh are related to specific failures in developing appropriate structures of financing and institutions that can support the efficiency of this financing within the context of the current political settlement. This results in a persistent failure to overcome the critical market failures constraining investments in this sector.

The final sector we look at is the emerging electronics sector in Bangladesh which is still very young but is a sector that displays strong potential. Unlike the garments sector, this sector has not benefited from institutional rents that supported learning,

and it is attempting to establish itself in a context of vulnerable democracy. Growth has, not surprisingly, been slow compared to the takeoff in the garments sector in the 1980s. What is interesting is that market failures constraining learning are being overcome in this sector largely as a result of a 'nationalistic' entrepreneurial attitude on the part of a pioneering company that decided to invest heavily in learning-by-doing on its own account. The sector, led by this company, has also been able to penetrate policy-making to a limited extent to change some policies to support its investments. Nevertheless, unlike the garments case, there have been no significant external rents supporting the learning process in electronics. This example shows that there are many routes to solving problems of technology acquisition even in the context of a very fragmented clientelist democracy. But there is a price to pay in terms of the pace of progress that is possible, and of course the electronics sector relied on dedicated entrepreneurs turning up who are not interested simply in profit maximization. The prospect of developing a new sector with all its risks is not the easiest and fastest way of making money in a clientelist political settlement.

The next section summarizes a theoretical framework developed in Khan (2009). This reviews the important market failures that have been identified in the literature to explain constraints on investment and technology acquisition in developing countries and argues that the most fundamental constraint is set by the difficulty of acquiring the tacit knowledge required for organizing competitive production processes. The theoretical framework argues that the achievement of competitiveness requires both the provision of opportunities for carrying out learning-by-doing but also institutional pressures and compulsions for ensuring that the participants put in high levels of effort that raise the probability that the learning will be successful and the support provided can be withdrawn to be re-allocated to other sectors. These conditions are closely connected to the characteristics of the political settlement because the relative power of organizations affected by investments in the sector, and indeed of institutions in the political domain can modify the effectiveness of particular institutions through which these market failures are being addressed. The political settlement in Pakistan was not appropriate for the effectiveness of the core institutions through which its industrial policy was being implemented in the 1960s, but in the 1980s, the institutional structure through which support for the garments industry in Bangladesh was organized proved to be very effective in meeting the requirements of learning success (Khan 1999). The next three sections apply this framework and the insights coming from our parallel analysis of the evolving political settlements in Bangladesh to the three sectors, garments, power generation and electronics.

2. Catching up and Learning: An Analytical Model

This section summarizes a model of learning and catching up developed in Khan (2009) which we will use to explain critical aspects of the growth performance in our three sectors in Bangladesh. The model helps to explain why industrial policy achieved some growth during the authoritarian period in Bangladesh when the country was part of Pakistan, but also why Pakistan's growth success, unlike the authoritarian states in East Asia, proved to be unsustainable. We then apply it to explain the remarkable success of the garments industry and the very specific financing arrangements and institutional incentives that contributed to high levels of effort in learning in this sector. The model also identifies the extent of the challenge

facing the electronics sector as it moves forward from the domestic start-up phase to attempt international competitiveness and export success.

At the heart of the development problem is a contracting problem that institutions or interventions have to solve if the adoption of modern technologies is to be accelerated. Developing countries find it difficult to catch up despite their significantly low wages and large pools of underemployed labour, often with many unemployed workers having respectable levels of formal education. This paradox can be explained in terms of a simple catching up model. Competitiveness depends not just on wages but also on the productivity of labour, and its effectiveness in converting expensive (often imported) inputs into outputs. The productivity of the labour and input used depends not just on the formal education of workers and managers, but more significantly on their tacit knowledge embodied in routines of production that can only be learnt through actual practice. Without periods spent in learning-by-doing, a developing country typically has productivity levels that are too low for it to competitively engage in production. This is true even for relatively low quality and basic production processes. As a result, a new firm or an entire country can find entry even into low-quality production blocked.

Competitiveness depends on both price and quality. Developing countries are entering a global market where products have established price-quality combinations and for many products there are minimum product qualities below which it is not possible to find a market regardless of price. The simplest way to capture critical features of the problem is to define products as combinations of characteristics. Broad clusters of characteristics define a particular type of product, but any product also has detailed characteristics of reliability, performance, attractiveness, design and a range of other functions that can distinguish particular products within the broad group in terms of 'quality' (Lancaster 1966; Sutton 2005, 2007). Products can therefore be indexed by quality, with higher quality cars (for instance) being (in general) more difficult and more expensive to produce, but also attracting a higher price that is high enough to make it worthwhile for producers to always seek to improve product quality.

Developing countries are generally not in the business of producing goods of higher quality than are being produced elsewhere. Developing new products is the process of product innovation that at best characterizes a small part of the productive sector even in middle income developing countries. Rather, their problem is to learn how to produce an increasing range chosen from the product qualities that already exist at a price that is equal to or lower than the ones already available. If it can produce an existing product of a particular quality at a price lower than that currently prevailing it has a chance of capturing markets from already established producers. At the very least, it has to be able to sell that product at the current global price for that quality. Lower quality products are generally easier to produce, but a minimum quality level usually exists for any product and if it fails to achieve this minimum quality, it will not be able to enter even with very low wages.

Higher quality products have, by definition, a higher selling price, so in general they allow either a higher wage or a higher profit mark-up or both. Wage and profit growth is therefore likely to require movements up the quality ladder or shifting to other products where quality levels are higher. A further reason for aiming at higher quality is that lower quality products are or can become inferior goods and as world incomes

increase, global consumers are likely to shift away from some goods of lower quality. Finally, lower quality products are more likely to be targeted as entry points by other poorer countries attempting to break into global production.

The move up the technology ladder is not always a smooth and incremental process. Low and high quality products within the same product family are not necessarily closely linked technologically. A country that specializes in low quality garments or mid-technology motor cars is not necessarily in the same technological trajectory as other countries producing designer garments or hybrid 'green' cars. Moving up the quality ladder can therefore in some cases mean significant and discontinuous shifts in the technological trajectory from 'mature' to 'evolving' technologies that in turn has significant implications for future productivity growth and quality improvement potential (Perez and Soete 1988). The production of mature products only allows wage growth as long as improvements in labour and input productivity are taking the developing country towards the frontier established in more advanced countries. But sustained productivity growth is only likely in higher product qualities where innovations are still taking place in more advanced countries.

It is therefore socially and privately desirable to produce the highest quality products that are feasible. Of course, for countries that do not yet have the technological capabilities to produce even basic lower quality products the challenge is to increase technological capabilities sufficiently to enter production at some acceptable level of quality. The catching up problem can therefore be defined as a) achieving the minimum quality that allows entry into globally competitive production for a variety of products even if the initial entry quality is low, b) spreading these basic manufacturing and productive capabilities broadly across the working population and c) systematically moving up the quality ladder across product categories. Many developing countries find it difficult to produce anything at a quality high enough to have a market, others produce a very limited range of items but of low quality and find it difficult to move up the product and quality ladder, and the more advanced produce a range of products, some of higher quality, but face challenges in sustaining quality improvements and even more in entering into new products.

To examine the implications of the quality and productivity problem in the simplest way, we use a simple mark-up pricing model that allows us to distinguish between the key variables that determine a country's ability to produce competitive products. The current global price of a particular product of quality Q is set by its cost of production in the global production leader as shown in eq. [1]:

$$P_Q^{global} = \left[\frac{W_Q^{leader}}{\Pi_Q^{leader}} + \sum_i \frac{P_{Qi}}{\alpha_{Qi}^{leader}} \right] \left(1 + m_Q\right) \qquad [1]$$

To simplify the notation we do not denote products and the discussion at this stage refers to a particular product with varying quality indexed by Q, so Q+1 represents a higher quality of the product compared to Q. P_Q^{global} is the international price of the product of quality Q. W_Q^{leader} is the wage level in the leading country in the industry

producing the product of quality Q. Π_Q^{leader} is the productivity of labour, measured by the output per person in this activity. There are also *i* other inputs used in the production of the product, and to simplify, we assume these inputs are globally traded, each with a global price of P_{Qi}. The efficiency with which inputs are used is measured by the productivity of input use (output per unit input). In the leader country, the input productivities of each of the *i* inputs are represented by α_{Qi}^{leader}. The price of the product is determined by the direct input costs per unit (of labour and the other *i* inputs) and the mark-up m_Q.

In the same way, the cost of production (in a common currency) in the developing country is $C_Q^{domestic}$ for quality Q given by:

$$C_Q^{domestic} = \left[\frac{W_Q^{domestic}}{\Pi_Q^{domestic}} + \sum_i \frac{P_{Qi}}{\alpha_{Qi}^{domestic}} \right] \left(1 + m_Q\right) \qquad [2]$$

The developing country can only engage in market production if $C_Q^{domestic} \leq P_Q^{global}$. It may appear that it should easily be able to do this since its wage level is significantly lower: $W_Q^{domestic} < W_Q^{leader}$. In fact generally it cannot break in because the developing country typically suffers from significant productivity disadvantages that more than negate its wage advantage. Output per person is generally lower, $\Pi_Q^{domestic} < \Pi_Q^{leader}$, indeed so low that despite low wages, the developing country cannot enter the production of most products, particularly high quality products.

In theory a low enough wage level could compensate for this, though in reality the required wage may be lower than is feasible even in the developing country. But while a lower output per person could in theory be compensated by lower wages, low wages may even in theory be unable to compensate for a lower efficiency of input use. This is because inputs have a global price that has to be paid. If $\alpha_{Qi}^{domestic} < \alpha_{Qi}^{leader}$, and if we assume that both countries face the same globally traded input prices, P_{Qi}, differences in input efficiency can only be compensated by further falls in the domestic wage rate. In this case, a small efficiency disadvantage across a number of inputs could mean that even with *zero* wages, the cost of production in the developing country may be higher simply because of inefficient input use. In fact, the general problem of development is that the domestic cost of production of almost everything is higher than the globally competitive price so that $C_Q^{domestic} > P_Q^{global}$ for most or even all products and product qualities.

Why is developing country productivity so low? Output per person, Π_Q, depends on both economy-wide and firm-level factors. Firm productivity can depend on public goods and utilities including the general level of education, infrastructure and the reliability of utility supplies. Firm productivity is also determined by firm-level variables like the capital equipment used by labour and the skill and experience of the workforce and management. In the same way, the efficiency of input use, α_{Qi} depends on the same economy-level variables as well as firm-level variables like the

type and sophistication of the capital equipment used and the skill and experience of the workforce using this equipment. The firm-level determinants of productivity describe the *technological capability* of the firm, its workers and its management. Understanding the factors that might determine technological capability is vital for understanding the catching-up problem faced by developing countries.

If productivity were simply a function of the type of machinery used, developing countries could achieve global competitiveness by investing in the purchase of the appropriate machinery. This is why early development theory and practice put much emphasis on accumulation and machinery imports. We now know this is not sufficient and differences in labour and input productivity can persist even with identical machinery (Clark and Wolcott 2002; Sutton 2007). The effects of general infrastructural constraints on productivity are also well known. Developing countries have inadequate physical infrastructure and investments in education. But this is a chicken and egg problem because the resources for significant improvements in infrastructure or in utilities that enable reliable and competitively priced utility supplies can only come from sustained growth. In the meantime, significant shortfalls in infrastructural quality, education and in utility supplies are likely to persist. The only viable short term response is to provide temporary assistance to catching up sectors in the form of more focused infrastructure provision to industrial clusters and/or compensatory fiscal and other arrangements to offset their higher costs.

While infrastructure constraints are widely recognized, the *technological capabilities* of workers and management are probably much more important in explaining why some countries take off when they do. The importance of technological capabilities as a constraint on technology acquisition is based on three interrelated observations. First, there is the observation that *tacit knowledge* is an important part of the skills and organizational capabilities that are necessary for the success of firms (Nelson and Winter 1982; Dosi 1988; Pelikan 1988; Perez and Soete 1988). Tacit knowledge is knowledge that cannot be codified (Polanyi 1967). All human activity involves the use of a mix of formal or codifiable knowledge (knowledge that can be communicated in words or symbols) and a variable amount of uncodifiable 'knowing-how-to' knowledge that is embodied in unconscious and often complex routines. The process of learning these routines inevitably involves practice rather than simply someone explaining what to do or reading a manual. Buying the machines for a factory together with the operation manuals does not give the investor anything like the distribution of tacit knowledge across all segments of the firm required to achieve international competitiveness. Even relatively low-technology production of relatively low quality products like garments requires a huge amount of tacit knowledge embodied in hundreds of workers and managers if production is to proceed smoothly and effectively to produce internationally competitive products. The tacit knowledge involved in producing higher quality products is likely to be exponentially greater.

Secondly and closely tied to the importance of tacit knowledge is the observation that *learning-by-doing* is critically important for acquiring tacit knowledge. This explains why developing countries can initially only achieve a level of productivity significantly lower than in more advanced countries. They also explain why the developing country can get stuck in a trap of low technology. Investments in new higher technology facilities would allow opportunities to engage in learning-by-doing that could eventually raise productivity enough to allow the competitive production of

products adding greater value. But these investments will not be undertaken if entrepreneurs believe that at current levels of productivity the investment would not be competitive. In turn, the failure to invest prevents the acquisition of experience that may have raised productivity over time. This learning trap can only be feasibly overcome if production can be initiated through a period of 'loss financing'. The question then becomes: why do private investors fail to treat this temporary loss financing as part of the overall investment cost of the project?

This takes us to our third and final observation. Since the private financing of these loss-making periods is not sufficiently widespread, there must be significant *market failures* constraining the financing of learning. By market failures we refer to contracting failures that result in a failure to capture achievable improvements in net social benefits. If the financing of learning-by-doing would allow the firm and the country to achieve higher levels of wages and profits, the failure of private contracting to achieve this financing is by definition a market failure. The policy response depends on the type of contracting problem or market failure that we think is constraining investment in loss-financing the learning-by-doing period.

The loss-financing required is described by considering a developing country facing a domestic cost of production for quality Q higher than the global price: $C_Q^{domestic} > P_Q^{global}$. The loss financing that would allow production (and learning-by-doing) to commence can be measured as a per unit 'subsidy', s_Q, which brings the domestic cost of production $C_Q^{domestic}$ into line with the global price P_Q^{global}. The 'subsidy' is not necessarily a transfer from government and could be private loss financing in the form of investors accepting a lower mark-up or putting in additional cash to cover a period of loss-making. A public subsidy can also be delivered in a variety of ways, some explicit, others more subtle. The possibilities include export subsidies, import protection, subsidized interest rates, subsidized inputs or infrastructure, or a cash subsidy. Contribution to loss-financing could also take the form of prioritized public spending on certain types of education or skills, or they may be implicit in the locational and pricing decisions of public infrastructure providers that reduce the costs of production of industries involved in learning. Thus a variety of loss financing schemes may enable learning-by-doing to commence, and in general we can describe these as providing 'rents for learning' (Khan 2000a).

The essential features of the problem can be shown by focusing on the situation where the domestic firm can produce products of quality Q, but at a higher cost than the current global price. The required effective rate of subsidy, s_Q, is given by the equality:

$$C_Q^{domestic}(1-s_Q) = P_Q^{global} \qquad [3]$$

Inserting eq. [2] defining $C_Q^{domestic}$ into this gives the required s_Q:

$$s_Q = 1 - \frac{P_Q^{global}}{(1+m_Q)}\left[\frac{W_Q^{dom}}{\Pi_Q^{domestic}} + \sum_i \frac{P_{Qi}}{\alpha_{Qi}^{domestic}}\right]^{-1} \qquad [4]$$

If follows from [4] that:

$$\frac{\partial s_Q}{\partial P_Q^{global}}, \frac{\partial s_Q}{\partial \Pi_Q^{domestic}}, \frac{\partial s_Q}{\partial \alpha_{Qi}^{domestic}} < 0$$

Not surprisingly, the required rate of subsidy declines if the global price rises, or if domestic labour productivity or input productivity rise. It follows that the faster domestic labour and input productivity grows, the sooner the subsidy can be removed. The subsidy per unit required for entering production is also likely to differ depending on the quality level the developing country initially aims for. Lower and higher quality versions of the same product are indexed by Q and Q+1. Using [3], the per unit subsidy required in each case is shown in equations [5] and [6].

$$s_Q = 1 - \frac{P_Q^{global}}{C_Q^{domestic}} \qquad [5]$$

And

$$s_{Q+1} = 1 - \frac{P_{Q+1}^{global}}{C_{Q+1}^{domestic}} \qquad [6]$$

Under plausible assumptions it is likely that $s_{Q+1} > s_Q$ implying that the rate of loss financing required for entering higher quality products is in general higher than that required for entering the production of lower quality products. The plausible assumption is that the productivity gap between the advanced country and the developing country is *greater* in the higher quality product than in the lower quality product. Both the gap in labour productivity and gaps in input productivities are likely to be greater in higher quality products because the latter typically require greater labour skills and more sophisticated management of inputs. A greater labour and input productivity gap between the two countries in quality Q+1 compared to quality Q can be represented as a set of inequalities:

$$\frac{\Pi_{Q+1}^{leader}}{\Pi_{Q+1}^{domestic}} > \frac{\Pi_Q^{leader}}{\Pi_Q^{domestic}} \textit{ and } \quad \frac{\alpha_{Q+1}^{leader}}{\alpha_{Q+1}^{domestic}} > \frac{\alpha_Q^{leader}}{\alpha_Q^{domestic}} \textit{ for some or all } i \qquad [7]$$

Equations [1] and [2] show that costs of production in both countries are inversely proportional to productivities of labour and inputs in the respective countries. All *i* inputs may not be used in the production of both qualities of the product, but if some or all of the inequalities in [7] hold, it must be the case that

$$\frac{P_{Q+1}^{global}}{C_{Q+1}^{domestic}} < \frac{P_Q^{global}}{C_Q^{domestic}} \qquad [8]$$

The inequality in [8] says that the cost of production in the developing country is greater (relative to the global price) for the higher quality product compared to the lower quality product. Using inequality [8] and comparing equations [5] and [6] it follows that a greater subsidy per unit will be required to achieve competitiveness in the higher quality product compared to the lower quality product.

$$s_{Q+1} > s_Q \qquad [9]$$

These results suggest two propositions.

Proposition 1. *The subsidy (loss-financing) required to enter production is in general higher the higher the quality of the product.*

Proposition 2. *By moving down the quality ladder, it may be possible to find a product quality for which no subsidy is required, but this is not assured.*

A further proposition follows from the observations of technology trajectories in developing countries. Economics textbooks often show innovation and technical progress as the outward shift of the production function that a country faces. In reality, this is very misleading because improvements in technological capabilities are likely to be very localized to the learning and innovation that happens around specific technologies (Atkinson and Stiglitz 1969; Stiglitz 1987). As a result, the learning-by-doing that results in productivity growth is likely to benefit technologies that are directly involved in the learning-by-doing and very closely associated technologies, rather than raising productivity across all technologies in use in the country. Learning-by-doing in the motor car industry is likely to raise productivity there but is unlikely to have any effect on the productivity in the garment industry, let alone in agriculture. Thus, rather than the smooth improvement of productivities across the board over time that is suggested by an outward shift of a 'production function', we are likely to see 'bumpy' improvements in productivity clustered around technologies that are actually being adopted and where learning-by-doing is successfully happening.

Proposition 3. *Potential productivity growth is likely to be localized around products and technologies involved in learning-by-doing, and productivity growth is likely to be higher in higher quality products that are likely to benefit from further innovation.*

We draw on these three propositions to construct Figure 1 which summarizes some of the fundamental issues facing catching up and technology acquisition in developing countries. The issues are presented in the figure in terms of 'capability curves' facing different developing countries across qualities of a particular product. However, the issues are of general applicability for understanding choices between sectors and technologies. The x-axis measures the quality of the product, and the y-axis the degree of competitiveness in producing that quality. Competitiveness in different qualities depends on the technological capabilities of firms in the country, and is measured by the ratio: $\frac{P_Q^{global}}{C_Q^{domestic}}$. The higher this ratio, the more competitive the developing country, and when the ratio is equal to 1, it can competitively sell in global markets.

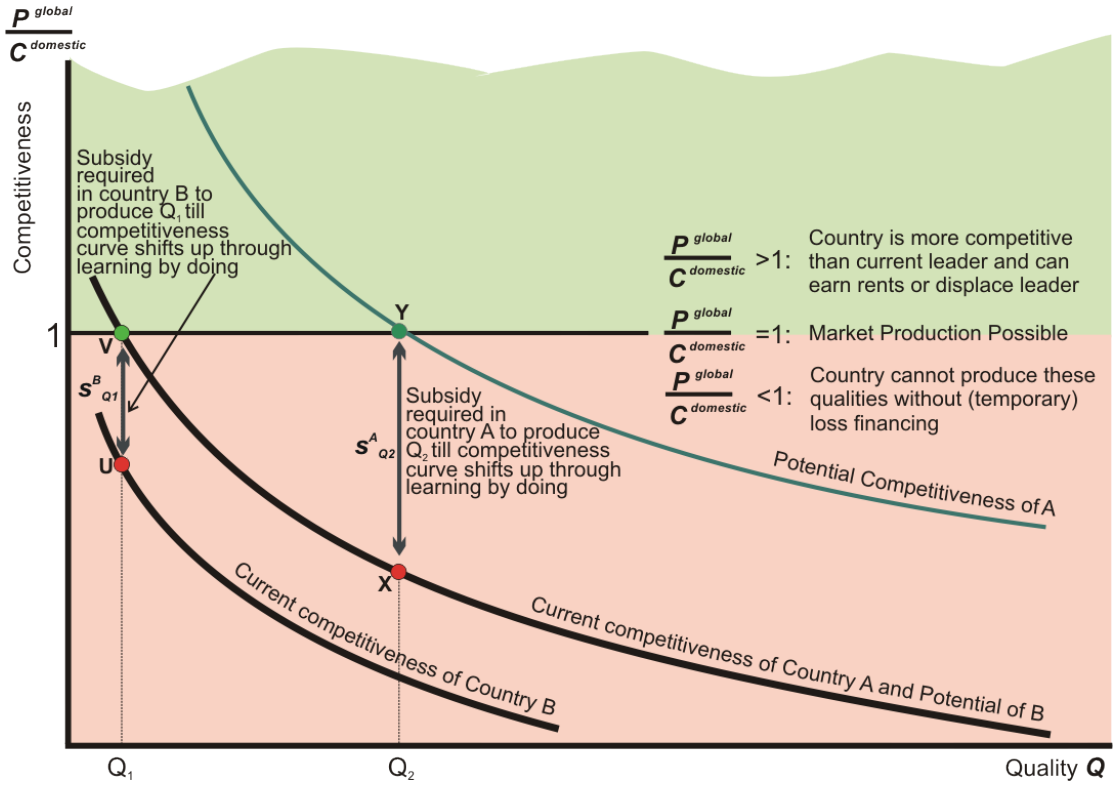

Figure 1 Loss Financing and Learning-by-doing

When the competitiveness ratio is less than 1, the developing country will either not enter production or will require (temporary) loss-financing from some source to allow production to commence. The required rate of 'subsidy', s_Q, equals $1-\frac{P_Q^{global}}{C_Q^{domestic}}$ in eq. [5], and is shown in Figure 1 as the gap between the unit competitiveness line and current competitiveness defined by the current technological capability curve.

From proposition 1 we know that competitiveness is likely to be lower for higher quality products so the curve of current capabilities is likely to be downward sloping. The greater productivity gap in higher qualities will force market-reliant developing countries to specialize in low quality products. This may have nothing to do with the relative price of labour and capital as in standard neoclassical theory. While we have developed this argument for products with the same characteristics but of different 'qualities' the capability curve can also be used to understand a range of related problems. For instance, we could see different 'qualities' as components of the same product in a vertically organized value chain. Low qualities would in this case be low value-added parts of the value chain (like packing and assembling), medium qualities would be producing the intermediate products going into the assembly and the higher qualities would be the design, product development and marketing parts of the value chain. In exactly the same way, the global 'price' of the low value added activities would be lower, and they would very likely be activities which require less tacit and formal knowledge and are therefore open to greater competition and lower mark-ups. To enter production at any point of the value chain a developing country would have to achieve a 'competitiveness ratio' of at least 1, so that its cost of production was no higher than the globally competitive level set by the global leader. At an even more

general level, we could use the capability curve to think about choices across all products ranked by technological sophistication or 'quality'.

Consistent with proposition 2, it is easy to imagine a developing country like B in Figure 1 where current capabilities are so low that it cannot even produce the lowest quality of this product, and indeed may not find any globally traded products that it can competitively produce. Country B needs loss-financing of s^B_{Q1} from the outset to even begin production of quality Q_1 at point U. Higher capability countries (like A) may be able to competitively produce some lower quality products like Q_1 at point V, without any loss-financing. But movements up the technology and quality ladder may again require loss-financing. If country A wants to begin production of quality Q_2 at X, it will require temporary loss-financing of s^A_{Q2}. If the competitiveness measure became more than 1, the developing country could either earn a rent (a mark-up higher than m_Q) by selling at the global price or it could bid down the global price in these qualities to below a price acceptable to the leader, thereby displacing the leader from these segments of the market and capturing much larger sales volumes. If the latter is the more profitable option, the developing country becomes one of the leaders for that quality and the global price is eventually defined by the cost of production and market power of the new leader.

Finally, proposition 3 tells us that even if a competitive quality level exists, there is a further policy issue to be considered. If future technological progress is localized around higher qualities and technologies, catching up can require programmes of assistance to improve quality to the points where innovation is happening faster in more advanced countries. In Figure 1 the potential productivity growth at quality Q_1 is relatively low because the technology is already mature and no further product and process innovations are likely at this quality level. The challenge for country B is to go from point U to point V. While country A can produce unaided at V, further productivity growth at this quality may be limited. Thus, even for country A, there may be a policy justification to assist learning-by-doing around quality Q_2 by organizing temporary loss-financing of s^A_{Q2}. The challenge for A would be to go from point X to point Y to achieve competitiveness. This would not only allow the country to raise its domestic value-added and therefore living standards using existing technologies, it would also ensure faster productivity growth in the future if innovation and productivity growth was higher at quality levels like Q_2 compared to mature and low technology quality levels like Q_1.

But if temporary loss-financing can assist a country to raise its productivity through learning-by-doing and thereby move up the quality ladder, how high should a country aim in terms of its entry quality for a product? Proposition 1 tells us that given existing capabilities, the higher the quality level that the country tries to achieve, the greater the financing cost measured by s_Q. Moreover, the greater the gap with leading countries at that quality, the longer is the catching up likely to take to reach break-even levels of competitiveness. As a result, trying to aim too high may involve excessively long periods of subsidy. Moreover, the competitiveness gap is only partially due to the absence of tacit knowledge. Some of the gap is also due levels of formal education and skills. If the initial gap is too big no amount of firm-level experience and learning-by-doing is likely to remove it entirely. As both the social time preference and the cost of finance in poor countries are likely to be high, there is a limit to how high up the quality ladder it is feasible to go. Moreover, the limited

evidence of private investments in learning-by-doing suggests that market failures must be significant in preventing these investments.

The private calculation would be of the following type. The private investor compares an investment in loss-financing of s_Q for the prospect of achieving a competitiveness of $\frac{P_Q^{global}}{C_Q^{domestic}}$ >1 after n years. In principle a competitiveness ratio greater than one can be achieved through productivity growth towards the advanced country simply because the developing country wage level is significantly lower. As soon as these levels of productivity are achieved (by assumption after *n* years), the developing country can achieve a rent in the form of a higher mark-up of $m_Q' > m_Q$ if it sells at the price set by the global leader. The firm also has an expectation that the rent $m_Q' - m_Q$ will last for *x* years. Then the magnitudes of s_Q, n, $m_Q' - m_Q$, x, and the discount rate or cost of finance of the entrepreneur will determine whether the investment in learning-by-doing is privately profitable. Both s_Q and n are likely to be lower if the product quality aimed for is close to the capabilities that already exist in the firm. Given the vast pools of cheap underemployed labour in developing countries, including workers with formal education at different levels, and with an array of technologies freely available at low to medium quality levels, we would expect a wide range of sectors and product qualities where investments in learning-by-doing by private entrepreneurs should be profitable. But in fact we see very little private investment in learning-by-doing in developing countries.

This suggests that the market failures that prevent private investors from contracting to achieve these investments may be important. In many developing countries it may appear that finance is not available for financing learning in the way we have described, but this may be because entrepreneurs do not believe that they can *actually* achieve the profits that are *potentially* available. Since the gains from successful catching up are potentially great, if these market failures could have been addressed, private financing alone may have allowed a significant increase in investments in learning. Thus, instead of attempting greater precision in determining the appropriate level of investment, it may be more appropriate to focus on the governance capabilities that may allow the country to address these market failures. In either case, a greater range of learning-by-doing could then be profitably financed.

Market Failures and the Need for Policy

The temporary loss-financing required to acquire vital skills and capabilities necessary for global competitiveness is no different from any other investment required to increase future profitability. If these investments are not forthcoming, there are likely to be specific contracting problems preventing the investments, which we define as 'market failures'. There are a number of possible market failures identified in the literature. These include the institutional difficulty of ensuring high levels of effort when learning is being subsidized, several different types of appropriability problems limiting the future profits of investors in the presence of externalities and the costs of coordinating complementary investments across sectors. In principle, several different market failures may be operating simultaneously, constraining investment in learning and technology acquisition, but some may be more important than others. Moreover, the governance requirements of addressing different market failures may be markedly different. If an important market failure

cannot be addressed with existing governance capabilities, attempts to address parts of the problem are likely to result in unsatisfactory results. One reason why policies supporting learning and technology acquisition in the past often yielded poor results is that important sources of market failures were not properly understood. As a result, governance capabilities that were necessary to address them were not adequately developed.

Our use of the term 'market failure' simply refers to a variety of reasons why voluntary private contracting can fail to exploit opportunities for increasing collective welfare. In using this terminology we do not presume that private contracting *could* have captured all these opportunities in a real market. For many market failures there is no *feasible* way in which private contracting could capture these potential gains, so some areas of necessary intervention remain even in societies where markets are very efficient. Nor do we use the general equilibrium benchmark as indicative of what markets could in theory achieve. If market failure is defined as a deviation from a welfare-maximizing general equilibrium, the usefulness of the concept can be justifiably questioned (Nelson 2008). Thinking of real economies as deviations from a general equilibrium can hinder rather than help the identification of policy because general equilibrium is not an achievable target and markets are systematically in disequilibrium (Scitovsky 1954; Kaldor 1972; Arndt 1988; Stiglitz 1996). Instead our definition of market failures simply refers to pragmatically identified potential improvements in net social benefits that are not being achieved because of various failures of contracting.

If private investors are failing to invest in profitable opportunities, either they do not have good information or (more likely) enforcement agencies are weak and investors do not believe that their potential future profits will actually be realized. For instance, investments in learning require credible performance conditions agreed with the firm so that managers and workers put in high levels of effort. If the enforcement of these contracts is weak, discipline cannot be imposed on the firm and investors may lose their money simply because the firm could not be bothered. The existence of market failures can provide a justification for intervention (for instance in the form of public financing of learning) but parallel governance capabilities are required to ensure that these interventions add net value. Without appropriate governance arrangements the intervention could result in an even worse outcome associated with governance failure. For instance, public resources could be spent *and* the technology could fail to be adopted. Governance failures are defined as government actions or inactions that reduce (or fail to raise) net social benefits (Krueger 1974; Toye 1987; Krueger 1990).

The likely source of the government failure will depend on what was causing the market failure in the first place. For instance, if the market failure was primarily caused by the difficulty of compelling effort on the part of workers and managers, the reduction of government failure would have to ensure that the *effort* is forthcoming if learning is financed by public funding. In contrast, if the market failure was caused by a failure of the private sector to coordinate investments across complementary sectors, public policy would require governance capabilities for effective coordination of investments. Identifying the most important sources of market failures is therefore a critical part of developing appropriate growth-enhancing capabilities to ensure that public policy is effective and the possibility of government failure is minimized.

Market Failure Constraining Learning and Technology Acquisition	Policy Implications	Required (Growth-Enhancing) Governance Capabilities
Appropriability problems facing **investments in skills**: Trained personnel can easily leave the firm	Co-financing of employment of new workers/workers in new sectors may be required	Requires agency with incentives aligned to ensure subsidies/co-financing not significantly mis-allocated
Appropriability problems facing **innovators**: Innovation companies avoid investing or training in developing countries	Protect IPRs but TRIPS may be too restrictive for developing countries: Weak incentives for MNCs to transfer core technologies	Requires strategies to create backward and forward linkages with domestic suppliers.
Appropriability problems facing **discovery**: Startups discovering new areas of national competence lose rents rapidly	Subsidize startup companies: But model based on specific technological and market competitiveness assumptions	Develop public-private partnerships to invest in discovery. Develop capability to stop subsidies beyond startup period
Failures of **coordination** can lower profits in complementary sectors and constrain investments in learning	Coordination of investments up to and including 'Big Push' strategies	Very significant governance capabilities required to coordinate and discipline investments across firms and sectors
Institutional problems in ensuring **effort** during learning: Both public and private investors in learning lose money	Co-financing of learning is often necessary but will fail unless high levels of effort can also be assured	Critical significance of country-specific institutions that can ensure high levels of effort during periods of loss-financing

Figure 2 Market Failures in Learning: Implications for Governance Capabilities

Figure 2 outlines a number of critical market failures affecting learning and technology acquisition in developing countries. Most have been discussed extensively in the literature but the governance capabilities required to address each of them have not received sufficient attention. The market failures and governance requirements are discussed in full in Khan (2009). In particular, we argue that an important cause of inadequate investment in learning-by-doing comes from institutional failures to *enforce effort* and these can result in the failure of both public and private investments in new sectors. Without a strategy for enforcing effort, attempts to address other market failures are very likely to fail because missing tacit knowledge is a fundamental constraint that affects all modern activities in developing countries. One of the weaknesses of learning and technology policies in the past was that the full range of problems causing potential market failures were often not identified, so the most critical governance capabilities could not be identified.

Institutional Problems of Ensuring Effort in Learning

Effective learning clearly requires time, but it also requires significant effort if it is to be successful. Time and effort are inversely related: the lower the effort, the longer the learning takes. Since learning has to be financed, this has obvious implications for the investors financing learning, whether public or private. Thus, in Figure 1 firms in country B may not be able to begin production at point U without loss-financing, but the question from the perspective of the feasibility of the financing is *how long* the firm will take to go from U to V, or even whether V will ever be reached. Loss-financing of s^{B}_{Q1} allows country B to begin production at Q_1 even while its

competitiveness curve is at its initial position. The viability of the loss-financing depends on the assumption that learning-by-doing will raise the competitiveness curve so that it will eventually pass through or be above V, implying that loss-financing will no longer be necessary. Similarly, country A could produce quality Q_1 but if it wants to move up the value chain to produce a higher value adding quality Q_2, it finds that it currently lacks the production capabilities to do so. Loss financing of s^A_{Q2} will allow it to begin production at quality Q_2 but viability now requires that the competitiveness curve should rise over time to intersect or pass above the point Y. The elevation of the competitiveness curve in turn depends on the degree of effort that is put into the learning process once the loss financing allows learning-by-doing to commence.

The policy responses to all the other market failures discussed earlier assume that the problem of ensuring high levels of effort in the learning process has been solved. Otherwise individual firms will fail to raise their productivity and even if all the other market failures are addressed, the overall policy will fail because permanent subsidization of production is obviously unviable. Unfortunately, disciplining the loss financing process is one of the most difficult problems to solve. Without appropriate incentives and compulsions, a production team can keep on repeating procedures without any improvement in its productivity. The 'learning' process can in effect continue indefinitely, as all countries with infant industries that refused to grow up have discovered. Indeed, even if the learning process is happening but is happening too slowly, the financing project may fail because the opportunity costs are unacceptable. If the public or private principals who are thinking of investing suspect this in advance, they will not invest in the first place.

The object of learning is to reach the breakeven point of competitiveness where loss-financing is no longer required. If we define this length of time as the break-even time, B_t, we can see that this plausibly depends on a number of obvious variables. First, it must depend on the initial gap between the country and the global leader which we can measure by the initial competitiveness ratio. The gap between the actual competitiveness ratio and the competitiveness that is required to match the leader is measured by the loss-financing or subsidy s_Q required to enter production at that level of quality. The greater the initial gap, the longer it will take to catch up and break even. The second variable determining the break-even time is most important for our analysis, and that is the level of *effort* the participants in the production process put in. Whatever the initial gap, a higher effort is likely to result in faster convergence towards the global standard. Effort can be measured by the intensity of application of workers and managers to continually improve productivity. This can be observed as the rate at which managers and workers experiment with and adapt production processes to achieve improvements in productivity. As experimentation and trials impose costs on individuals and can also create differentiation between the more and less able, particularly at the level of management and supervision, higher levels of effort are more difficult to achieve, everything else being the same.

Finally, the breakeven period can also depend on country and firm specific factors. Country specific factors refer to general levels of education, exposure to technology, prior history of production, infrastructural quality and so on. If a country is significantly behind the technological capability required to produce a product of a particular quality, it may fail to approach required levels of competitiveness within any feasible time period. Firm level factors refer to idiosyncratic differences in the

quality of entrepreneurship, the quality of technicians and managers inherited by a firm and so on. These variables are summarized in eq. [10]:

$$B_t = f\left(s_Q, e, C, F\right) \qquad [10]$$

The break-even period B_t is likely to be longer the higher the initial gap in competitiveness measured by s_Q, the lower the level of effort, e, and also on C and F, which describe country-specific and firm-specific factors respectively.

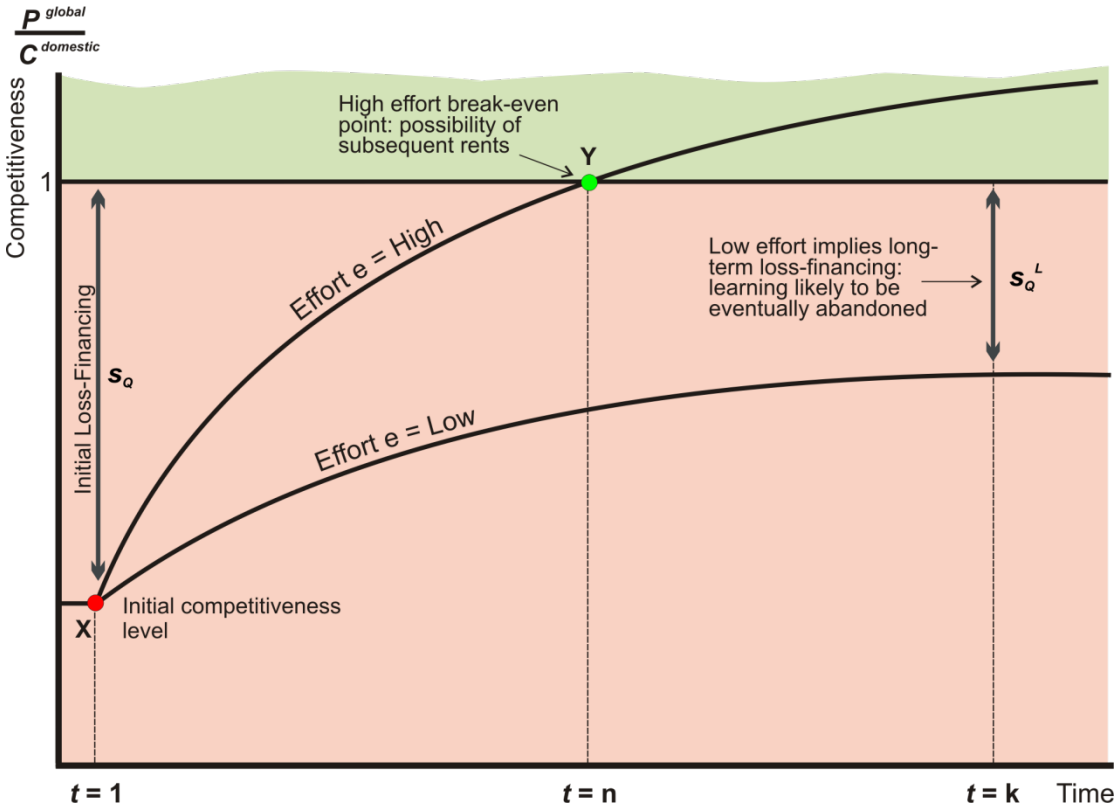

Figure 3 Effort Levels and the Viability of the Learning Process

Figure 3 focuses on the key role of differences in the level of effort keeping all other determinants constant, and focusing on catching up in the production of a specific product of quality Q. The figure tracks the achievement of competitiveness over time. Compared to Figure 1, the critical question we are now asking is the following: if country A began at point X, how long will it take to reach Y, or will it reach Y at all? The idea is that with any given level of loss-financing, the pace of achieving improvements in labour and input productivity, and therefore in achieving international competitiveness, depends on the level of effort put into learning. To simplify, we distinguish between two levels of effort, defined as high and low.

At time t=1 country A's competitiveness is too low for it to enter production at quality Q without loss-financing from some source. The initial loss finance is shown as s_Q in Figure 3, which allows the country to begin production and initiate the learning-by-doing process. If effort levels are high, the breakeven period B_t = n periods. At that point, loss financing can be abandoned and indeed the country may even be in a

position to earn rents in subsequent periods. Note that the firm will just have substituted market profits earned with effort for a subsidy that came for free. It is this incentive incompatibility that requires some form of external enforcement or disciplining for financing to work in these contexts. In contrast, if effort levels are low, international competitiveness may not be achieved even if there are some initial improvements in productivity. In the low effort scenario shown in Figure 3 $B_t = \infty$, which means convergence does not happen. After k periods a steady-state subsidy of s_Q^L emerges which is indefinitely required for production to continue. Note that productivity growth is also happening in the leader country, so a constant s_Q^L may emerge even with some domestic productivity growth. This is equivalent to the case of infant industries that failed to grow up. Eventually, loss-financed learning in these circumstances is very likely to be abandoned because the social cost grows over time.

Clearly, financiers of learning would like the highest level of effort to be forthcoming so that not only is there convergence but also convergence in the shortest possible time. In contrast, workers and managers engaged in learning may have mixed motives. They may understand that jobs and perhaps income growth may eventually depend on productivity growth. But since learning is costly in terms of effort and may result in adverse outcomes for individuals who fail, workers and managers have an individual interest to free ride on the effort of others, which can lead them to distort true information about their own levels of effort. They may often also articulate a collective interest to pursue a less traumatic learning path without recognizing its long-run non-viability. These individual or collective strategies can extend the period of loss-financing much beyond what is acceptable to public or private financiers. In extreme cases, such as the low effort trajectory shown in Figure 3, the result may be that financiers are stuck in a situation of permanent loss-making and the project has to be eventually abandoned with significant losses. Alternatively, financiers may suspect that this will be the case and the investment will not be forthcoming in the first place.

Since in the long run it is plausible to argue that high levels of effort would have potentially benefited all participants and society, there is a market failure here that can be described as a failure of credible 'contracting' between investors and the firm engaged in learning. The problem is therefore not one of an inadequate rule of law and the insufficient enforcement of formal contracts in courts, but broader political economy issues of achieving sufficiently high levels of compulsion for different sets of agents who are required to put in high levels of effort. The underlying institutional failure here is very similar to principal-agent problems that can in general result in breakdowns in team effort and in credit markets result in inadequate investment (Alchian and Demsetz 1972; Stiglitz and Weiss 1981; Shleifer and Vishny 1997). However, the specific problems here refer to a much wider range of issues than the asymmetric information literature on monitoring or credit market failures normally addresses. In particular, we want to highlight the issues of enforcing discipline on the recipients of support in the context of particular political settlements. The broad 'variables' that are likely to affect the level of effort are listed in eq. [11]:

$$e = f\,(FI,\ GA,\ FS,\ PS) \qquad [11]$$

Effort *e* is defined as the intensity with which learning is carried out, measured by the pace of experimentation and trials within the production process. The higher the level

of effort, the faster the movement up the competitiveness ladder, as Figure 3 shows. *FI* is the specific *financing instrument* through which the learning is to be financed. The financing instrument is a micro-level institution because it defines the rules for a particular type of financing. These 'rules' define who contributes what, the expectations of the different parties, and measures to be taken if expectations are not met. Different financing instruments have design features that aim to compel high levels of effort while sharing risks and returns in ways that all parties find acceptable. The other three variables define the context in which there particular institution is located and are components of the macro political settlement.

GA describes the characteristics of the *governance agencies* charged with monitoring and enforcing the contracts underpinning the financing instrument. Governance agencies are a subset of the bureaucratic organizations that define the bureaucratic subsystem of a political settlement[2]. The enforcement of the rules implicit in each instrument can vary widely depending on the formal and informal enforcement capabilities of the agencies responsible for enforcement.

FS is the *firm structure* within which learning is being organized, referring to relevant characteristics of the firm(s) including size, age and internal organization, and the type of market in which it operates. The firms that are involved in the catching up process are a subset of the economic organizations that define the economic subsystem of a political settlement.

PS describes relevant characteristics of the *political structure*, in particular the distribution of power across political organizations in the political subsystem of the political settlement. The function *f* allows interactions between these variables so that the effect of any variable *can* depend on the 'value' of the other variables in a non-linear way.

The macro political settlement is an operational equilibrium of institutions and organizations that describes the effective relative power of different types of organizations. The efficacy of a particular financing instrument has to be assessed in this specific context. The likely interdependence between the last three variables (describing aspects of the macro political settlement) and a particular financing instrument is shown in Figure 4. From a policy perspective, it is also important to distinguish between variables that are difficult to change and which can therefore only be the targets of policy in the long term, and variables that are easier to change. The variables that are most difficult to change are best treated as 'exogenous' and policy is likely to have to accept them as 'given' in the medium term. In Figure 4, the political structure, *PS*, appears at the top as it is likely to be the 'variable' that is most difficult to change. However, even the political structure can of course change as a result of 'political' policy, for instance through the organization of new political coalitions or movements. Indeed, if the political structure is very unfavourable for overcoming growth constraints, the only meaningful policy may be a process of political reorganization. Of course, this is only a task that political organizations with legitimate leaderships can hope to achieve.

[2] See the companion piece entitled *The Political Settlement and its Evolution in Bangladesh*

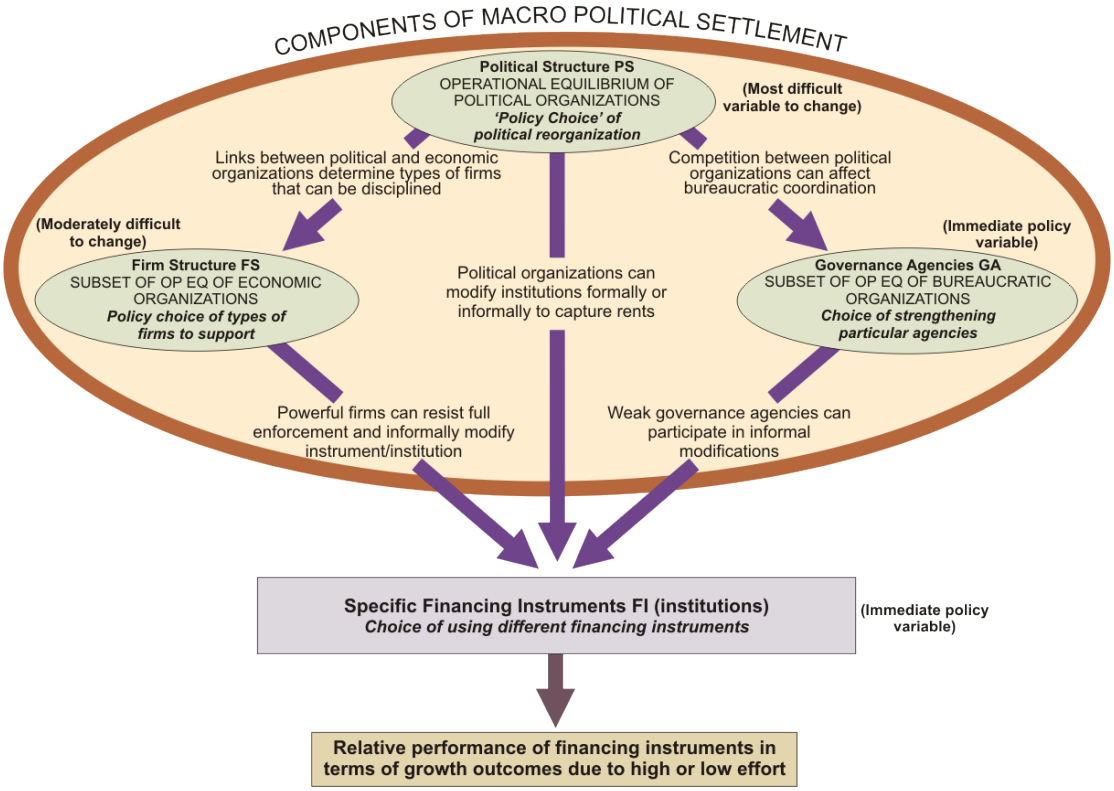

Figure 4 The Interdependence of Variables Determining Effort

Next in terms of difficulty of changing is the firm structure variable, *FS*. This can be affected by policy (by selecting particular groups of firms or sectors for support) but it may be difficult to change this rapidly. Therefore, the variables that are usually the most direct targets for policy are the financing instruments, *FI*, and the associated governance agencies, *GA*. However, both may be difficult to change if the existing structure of instruments and governance agencies (bureaucratic organizations) are in an operational equilibrium that satisfies powerful economic and political organizations. Nevertheless, in most cases, it is likely to be relatively easier to affect these variables than the others. However, the most important point from our perspective is that the most appropriate financing instruments and associated governance agencies cannot be identified without at least identifying the constraints set by the other variables even if those variables cannot be easily changed. In some cases these other variables may be so unfavourable that any policy for promoting growth may have no option but to address either or both of the higher level variables as a medium or long-term goal. But in any case, the policy variables are unlikely to be 'separable', meaning that it is unlikely that 'good financing instruments' or 'effective governance agencies' can be identified independently of a macro political settlement in which they are to be located.

The most important interdependencies between these variables are shown in Figure 4. The political structure describing the configuration of political organizations describes the operational equilibrium in the political system. This has important implications for the other variables. The cohesiveness or fragmentation of political organizations determines the ease with which economic organizations can protect their interests even if these damage the collective benefit. The time horizon and enforcement capabilities of political organizations are directly relevant because if powerful

political organizations feel that the distribution of benefits from particular institutions is unacceptable, formal or informal modifications are likely to follow. And finally, the competition between political organizations can affect the coordination and enforcement capabilities of bureaucratic organizations. The effect of the formal financing instrument can therefore depend not only on its formal details but also on how its enforcement is modified. Economic organizations that are affected may have both the incentive and the holding power to modify the implementation of these institutions, indirectly with the assistance of some political organizations. Governance agencies may also have a limited ability to enforce important aspects of the instrument because of its own weak capabilities, and also because these organizations work under and with political organizations that may have other goals.

The problem of sustaining effort is therefore an iterative search across these variables to find the combination that is both feasible for a country and likely to achieve moderate to high levels of effort, even if in a restricted subset of firms and sectors. We will see later that some of these interdependencies can explain why particular types of learning processes worked in particular contexts or were less dramatic in others.

Financing Instruments

Learning can be financed through a variety of financing instruments. Financing instruments are institutional rules and the question is whether the efficacy of a particular financing institution can be assessed independent of the context defined by the other variables in eq. [11]. Each instrument implicitly defines rules of contribution and reward and therefore the incentives and responsibilities of the different participants in the learning process. Effort is likely to be maximized if the individuals putting in the effort gain significantly from their effort or suffer potential losses if they fail to put in effort. But effort will only be financed if the financiers also get a return. In team production where large numbers of people have to cooperate, sustaining high levels of effort is a challenge. Supervision and coordination at different levels become important because individuals can attempt to conceal their true levels of effort. Sustaining effort may now require supervision and incentives for those supervising the effort for instance by making them 'residual claimants' (Alchian and Demsetz 1972). But even this may not be sufficient unless the residual claimants also have the effective authority to impose discipline on team members. The residual claimant model describes in a partial way the basic 'capitalist' firm and its underlying property rights. It is partial because it underplays the significance of the political power that gives owners the effective authority to carry out disciplining functions.

In early developers, compulsions for high levels of effort and labour discipline were based on a configuration of property rights described as 'capitalist'. Capitalist rights define a class of asset owners (residual claimants) and a class of property-less workers who are compelled to accept workplace discipline. This configuration of property rights was sufficient to ensure productivity growth in early developers who could grow through incremental innovations in products and processes. As technology leaders, the early capitalist developers had to innovate, but they did not have to achieve significant jumps in their productivity through learning to become globally competitive.

The learning requirements of contemporary (late) development are different. Firms do not have to innovate to the same extent, but are faced with a massive gap between their initial technological capabilities and the minimum required to produce anything in global competition. An important consequence of the catching up problem is that 'capitalist' property rights are no longer sufficient for ensuring effort. Contemporary late developers need to organize and finance learning-by-doing to learn to use technologies far in advance of their existing capabilities. This now requires loss financing for entry into new sectors and technologies, and often requires financing by outside investors including the state. More complex financing instruments and complementary governance structures need to emerge at a much earlier stage of development. It also follows that more complex systems of incentives and compulsions to ensure effort are also required at a much earlier stage.

In theory, learning could still be financed by owner-entrepreneurs investing in their own firm. For instance, an owner-entrepreneur can accept a longer period of losses to set up in a higher quality sector. This is no different from any other investment, where the entrepreneur accepts temporarily low profits to achieve higher profits later. The only difference is that here the investment is in the acquisition of tacit knowledge. As the owner is the residual claimant, there are strong incentives to monitor effort to reduce the period of loss-making. This case is closest to the simple capitalist firm with its strong incentives and compulsions for sustaining effort. Whether high levels of effort can be sustained in this case is likely to depend on exogenous political factors that determine the extent to which owners can enforce discipline on their workforce, and social and political factors determining collective discipline, cooperation and trust (Leibenstein 1982).

But owner-financed learning is likely to be relatively rare given the long periods of learning required and the uncertainty of ensuring effort in new products. The typical developing country entrepreneur lacks technological capabilities and the learning process therefore involves learning-by-doing by the entrepreneur. There is therefore a high degree of uncertainty in the success of the enterprise and in most cases the risk-return profile is too adverse to attract the sole investor. There is also likely to be a significant gap between the resource base of the typical entrepreneur in a developing country and the investments required to acquire machinery and finance periods of loss-making of uncertain length. The risks and the financing may both be beyond the capacities of most individuals attempting to become entrepreneurs in a developing country. Therefore successful development is likely to be associated with more complex 'financing instruments' where the entrepreneur does not directly provide the entire finance but raises it in different ways.

If the entrepreneur borrows from a bank with debt backed by collateral, the incentives could be quite similar to the first case. If the bank has the power to sell collateral in case of non-performance, the entrepreneur bears all the risk of learning. For large investments or new technologies, where there is a chance of failure despite the best effort of the entrepreneur, investment on these terms is unlikely. But banks in many developing countries are unlikely to have effective powers to realize collateral and the weak compulsions on the entrepreneur can result in *low* effort and potential losses for banks. If banks know this, they in turn may be unlikely to lend for new technologies or to new entrepreneurs. If the financing comes from equity investors or other investors outside the firm, standard principal-agent problems emerge. Will the

manager put in sufficient effort; will workers accept the discipline that managers try to impose on them under these circumstances?

More complex issues arise when financing comes from the state. This can take various instrumental forms, ranging from tax breaks, low interest credit, subsidized inputs, subsidized utilities or infrastructure, export subsidies, or the protection of domestic markets. In theory, it should be possible to devise financing instruments that allow periods of learning to be financed with strong compulsions for rapid productivity growth. For instance, the instrument could be designed to progressively increase exposure to competitive international prices by announcing *ex ante* the rate at which the level of export subsidy or the level of protection of domestic markets will be reduced.

Governance Agencies

Financing instruments as institutions can be enforced with different degrees of success and may also be informally modified in different ways in the typical clientelist political settlement. A financing instrument may appear to make sense seen as a formal contract because it may allocate incentives and compulsions, rewards and penalties in an appropriate way. But the financing instrument can only be effective if there are bureaucratic organizations that can serve as governance agencies in terms of enforcing this contract. The capabilities of the bureaucratic organizations and their location within a specific political settlement that may constrain or enable the enforcement of particular institutions can therefore play an important role in explaining the performance of particular institutions[3]. The bureaucratic organization that is relevant depends on the financing instrument. For instance, if the financing for learning is provided through export subsidies, the compulsion on effort depends on an institutional rule that export subsidies will be reduced over time. This is only likely to be credible if the agency responsible for managing subsidies can do so without pressure from firms and their allied political organizations who may want to change this policy in the future. This could be the finance ministry or the industries ministry. If the loss-financing is based on credit from industrial banks, the relevant organizations operating as governance agencies are the banks and other agencies like courts and arbitration bodies that they rely on for enforcement. Do they collectively have the capabilities to monitor loans effectively; do they have the power to withdraw loans if firms are failing? If the loss-financing is organized through subsidies, the relevant bureaucratic organizations are those responsible for administering the subsidies. Do they have capabilities for monitoring performance and withdrawing the subsidies if necessary?

If financing is internal to the firm, the enforcement of productivity growth is a struggle largely internal to the firm. Loss-financing could take the form of owners accepting a lower mark-up before the project becomes profitable. The enforcement of effort in this case is indistinguishable from 'normal' conflicts over discipline within a capitalist firm. The governance organizations relevant here would be formal and informal external bureaucratic organizations regulating and enforcing labour contracts, or contracts between owners and firm managers as third party enforcers. In the 'good governance' literature, contract enforcement and the rule of law are considered to be necessary and sufficient capabilities for achieving growth

[3] *The Political Settlement and its Evolution in Bangladesh* (2011) is a companion paper to this one.

(Acemoglu, et al. 2004; Khan 2007). The assumption is that with sufficiently robust contract enforcement firms looking for financing for their internal learning will be able to raise it in the market. In theory this is a plausible claim, in practice there are no examples of developing countries that are able to improve generalized contract enforcement to the extent that specific solutions for solving market failures in critical areas like learning are no longer required.

Firm Structure

The firm structure describes the distribution of economic organizations in the economic subsystem. The degree to which effort can be enforced is likely to depend on the internal organization of firms, and on the structure of economic organizations in the market. We have already seen that effort is more likely to be forthcoming in firms where owners are investors and they control the firm. This case comes closest to the classical model of a capitalist firm driving productivity growth. (Alchian and Demsetz 1972; Wood 2002). The ideal type of capitalist firm has a number of characteristics that ensure that it can mobilize high levels of effort. First, it has strong internal hierarchies and a workforce disciplined by a competitive labour market (possibly with a reserve army of unemployed labour creating a credible threat of replacement in case of low effort). Secondly, the theoretical capitalist firm has significant retained profits giving it the financial strength to invest in itself and the incentive to protect its own capital. Thirdly, the theoretical capitalist firm already has the capability to use its technology and is not facing an indeterminate learning period. Finally, the ideal capitalist firm analysed in textbooks is not individually politically connected or powerful, though the class of capitalist firms may collectively have significant holding power. This means that the ideal-type capitalist firm does not have the capacity to override contracts with external investors or the state using political connections and power but does have the power to ensure that property rights and the rule of law are in general well enforced. The real capitalist firm may significantly differ in some or all of these respects, but the differences are particularly important in developing countries, with significant implications for the effort expected in a context where outside investors invest in learning.

Internal hierarchies are unlikely to be strong in many firms in developing countries. Firms with strong internal hierarchies are likely to be older more established firms where employees, particularly at managerial levels, have large sunk investments in firm-specific career structures. These employees stand to lose their investments and their career prospects if the firm collapses, and are likely to put in effort in learning and experimenting with new technologies when new investments take place. Newer firms that are skill intensive and where the production team has high human capital are also likely to be good at organizing high levels of effort, particularly if the team leaders also own the firm. Firms engaged in software development in developing countries are an example. In contrast, start-up firms using conventional technologies in developing countries are likely to face significant problems with their internal organization of effort, slowing down their learning process. Secondly, internal finance is likely to be significant only in well-established and larger firms. The owners are likely to have a greater incentive in ensuring effort if they have committed more of their own money in internal financing. On the other hand, most firms in developing countries are likely to require significant outside finance, diluting the incentives owners have to put in high levels of effort in the absence of effective governance by external agencies.

Thirdly, by definition, most firms in developing countries do not have high enough levels of technological and entrepreneurial capabilities to be competitive in the qualities that they want to produce. This is a general problem, not related to the problem of firms trying to produce products that are too sophisticated for them. There is a gap between existing capabilities of economic organizations and the level required to achieve competitiveness for almost all quality levels, though this gap is higher for more sophisticated products and qualities. Most start-up firms also have to spend a considerable amount of time to learn how to learn before they actually start learning (Stiglitz 1987). Finally, real world firms are likely to have strong political connections and indeed many firms may be set up by entrepreneurs closely connected to politics, particularly in developing countries. Alternatively, entrepreneurs are likely to patronize politicians, providing the owners with significant political power to resist or influence the enforcement activities of external agencies. Older, larger and well-established firms are more likely to be well-connected to different political organizations and it may be difficult to discipline them in a context where external loss-financing is coming from instruments controlled by the state.

These considerations mean that external financiers of learning have to look at a complex range of issues in determining which types of firms, products and financing instruments are more likely to result in competitiveness through effective learning-by-doing. Large economic organizations may have greater technological capabilities, better internal discipline and are perhaps able to commit more of their own finances. But they may also have oligopolistic political power based on close connections with particular political organizations that makes it difficult to impose credible threats on them to enforce effort. Given the interdependence of political and technological factors determining effort and efficiency, it is not surprising that the characteristics of the efficient firm varies significantly across countries (Whitley 1992).

For instance, both Pakistan and South Korea in the 1960s assisted large domestic conglomerates to acquire and learn new technologies and move into export markets, using similar financing instruments like subsidized credits, import protection and export subsidies. However, effective compulsions for high levels of effort for firms of this type could not be achieved in Pakistan but were achieved in South Korea. To a significant extent this was because large conglomerates in Pakistan acquired the political capacity to protect their rents from threats of withdrawal in a way that South Korean *chaebols* could not. In Taiwan, a large firm strategy may also have failed because such firms would be owned by local Taiwanese entrepreneurs. The immigrant political leadership of the KMT in the 1950s and 1960s may not have had the political authority to stand up to powerful locally owned conglomerates so early in the development process. Fortunately for Taiwan, government strategies of technology acquisition initially focused on supporting smaller firms in high technology sectors, either by accident or design. As a result, the Taiwanese state's ability to enforce discipline was not politically constrained as it may have otherwise been. The interesting counterfactual is whether countries like Pakistan and India may have fared better if they had designed support schemes for smaller firms who may have found it much more difficult to find allies within political organizations willing to protect them for a price in the manner of the 'twenty-two families' of Pakistan or the big business houses of India (Wade 1988; Amsden 1989; Wade 1990; Whitley 1992; Khan 1999; Khan and Blankenburg 2009).

Of course, in many product and quality lines, scale economies may rule out a strategy based on promoting a large number of relatively small economic organizations. When it is unavoidable for technology acquisition strategies to work with economic organizations with market and political power, the learning strategies have to be designed appropriately. Bureaucratic organizations entrusted with enforcement have to be sufficiently strong in terms of their bureaucratic capabilities and even more so in terms of the political support they have for preventing the big players from resisting discipline. In some developing countries the answer may be to delegate the governance of the financing to independent external agencies like industrial banks. If the management of the industrial bank is capable and committed to competitiveness, and not accessible to political factions, the credibility of withdrawal may be high enough to enable learning to be financed in sectors with scale economies.

The Political Structure

The political structure describes the operational equilibrium in the political subsystem based on the distribution of power between political organizations and the political institutions regulating their interaction and competition (Khan 1995, 2010)[4]. The political structure affects all other subsystems but is also the most difficult to change in terms of policy interventions. Differences in underlying political structures can explain why apparently *similar* governance agencies, firm structures and financing instruments have resulted in very *different* outcomes across countries. For instance, South Korea and Pakistan in the 1960s both used fairly similar strategies of providing long-term bank credit to large conglomerates involved in capability development in export-oriented sectors. The organization of the bureaucracy regulating these interventions was also similar, with coordination and monitoring organized by planning agencies operating under the President.

However, the outcomes were significantly different because the distribution of organizational power in their political systems had significant implications for the enforcement of the conditions required for generating high levels of effort (Khan 1999). Since the design of the financing instruments was similar in these two cases, the major difference was in their monitoring and enforcement. An attempt to enforce these financing instruments in Pakistan to the extent that they could be in South Korea threatened to result in a steep decline in stability and in unacceptable political costs given the protection provided to economic organizations by organizations within the political structure. The operational equilibrium in Pakistan therefore required a significant modification in the operation of important financing instruments. The result was that the incentives and compulsions to put in high levels of effort were seriously attenuated. The effects on effort in turn resulted in a slow growth in competitiveness and ultimately the abandonment of the strategy.

Equally, differences in political structures across countries can help to explain why effective financing instruments and governance agencies responsible for their enforcement have *differed* significantly across *similarly successful* catching-up countries. South Korea, Taiwan, China and Malaysia demonstrate significant differences in their catching up strategies in terms of how they financed learning, the

[4] See also the companion piece entitled *The Political Settlement and its Evolution in Bangladesh* (2011).

agencies enforcing and managing the financing strategies, and the types of firms and sectors supported. Success required that the ensemble of variables determining effort in eq. [11] were consistent in terms of the configuration of political power so that the mechanisms for imposing compulsions required for high effort were credible and enforceable (Khan 2000b, 2008b; Khan and Blankenburg 2009).

Interdependencies Affecting Policies for Learning

Effective learning strategies require as a precondition an ensemble of conditions to ensure high levels of effort. This is not always easy to achieve, and the failure to address these problems have been responsible for the abandonment of many learning and technology acquisition strategies across developing countries. An important reason why effective policies have been difficult to devise is because the variables in eq. [11] determining levels of effort are *interdependent* and so their effects are likely to be non-linear. This means that the best instrument for financing, for instance, may depend on the type of political settlement that a country has inherited. As a result, there is no single set of financing and governance arrangements that characterize all successful catching up countries. It also follows that it is not possible to simply imitate the policy or governance structures of more successful developers.

Given these interdependence, there are likely to be non-linearities in the relationships between these variables and effort. A financing arrangement that would result in an acceleration of learning in a particular political settlement and applied to a particular structure of firms may have a different effect in another political settlement or applied to a different structure of firms. For instance, historical evidence shows that financing learning-by-doing through conditional export subsidies to large firms may work very well if the political relationship between firms and governments allows subsidy withdrawal to be credible. But export subsidies to large firms may be a poor way of delivering financing if large firms have powerful political friends who can protect them from state attempts at subsidy withdrawal.

This means that the effects of institutions and governance arrangements on the pace of learning in particular countries can only be identified by looking at possible interactions between (at least) the variables identified in Figure 4. Historical case studies support this argument by demonstrating that the efficacy of particular instruments and governance arrangements have varied across countries according to their underlying political settlements (Khan 1999, 2000b; Khan and Blankenburg 2009). While almost every developing country attempted some form of state-led catching up, their relative success depended very critically on combinations of variables that determined the level of effort in the catching-up exercise.

3. The Garments Takeoff

When Bangladesh became independent in 1971, there was hardly any Bengali owned industry, and the little that had developed was destroyed by the sweeping nationalizations of the 'socialist' regime[5]. By 1974-5, the dominant economic organizations were public sector corporations that included almost the entire manufacturing and industrial base. Ninety two per cent of industrial assets were nationalized by 1975 (Sobhan and Ahmad 1980: Table 10.1; Murshid and Sobhan

[5] See the discussion of this period in our companion paper on political settlements in Bangladesh.

1987: 3-4). The public sector corporations were largely inefficient and served as venues for job creation for the clients of the regime and enabled political accumulation based on price fixing, the political allocation of contracts and even outright theft. Bengali economic organizations in the private sector were for a while excluded from large-scale industry, and concentrated on trading and acquiring government contracts for infrastructure construction. These activities were lucrative because political connections resulted in very attractive terms and the quality of the output was not closely monitored. The result was a significant and rapid accumulation of money in new hands.

Processes of accumulation based on the direct and indirect exercise of power can be described as 'primitive accumulation'. The independence of Bangladesh created opportunities for primitive accumulation on an unprecedented scale. It created a new moneyed class that was different from the older but tiny Bengali industrial bourgeoisie that had developed during the Pakistan period. The beneficiaries of this primitive accumulation were political entrepreneurs closely connected with the public sector and the new private sector entrepreneurs based on trade and public contracts who had close political links with the dominant party. By the late-1970s Bangladesh had hundreds if not thousands of politically-connected entrepreneurs who had accumulated relatively significant blocks of capital and who had become as a result potential investors who could eventually hope to be small to medium capitalists. These individuals began to look around for simple technologies to invest in, if only to preserve their capital. It was at this stage that a lucky accident involving internationally created rents had a significant impact on Bangladesh's prospects.

The growth of the ready-made garments industry in Bangladesh has often been presented as a vindication of the success of free market policies combined with the virtual absence of labour market protections in Bangladesh. The overthrow of the Awami League in 1975 allowed a reversal of the policies of socialism. In the years that followed, both liberalization and privatization gradually followed. But in fact investment even in the simplest of technologies involves significant risks for domestic investors when these technologies are new to the economy. The machines may be relatively simple and the formal skills of the potential workers may appear to be more than appropriate. But setting up a factory that can achieve international quality standards, meet orders on time and manage internal timekeeping and waste management to achieve global competitiveness is a different order of requirements altogether. The time it will take an investor to achieve global competitiveness is not known since this depends on the time their production teams take to acquire the tacit knowledge required to operate their factories competitively within very specialized globalized production networks. Nor is it viable for foreign firms to invest and finance learning-by-doing in low-margin, low technology substitutes simply on the promise of future profits. The future profits are unlikely to be high enough in most cases to compensate for the risks. This is of course why global production does not rapidly shift to the poorest countries. But a combination of factors made this transfer of technology feasible for Bangladesh in the early 1980s.

The takeoff of the garments industry is important because it demonstrates that liberalized product and labour markets are not sufficient for achieving a globally competitive industry. The takeoff also required a set of 'financing instruments' that were governed by different types of agencies, and located in a specific political

context, which collectively ensured that the financing both allowed learning-by-doing to begin *and* also ensured that high levels of effort would be put in. Indeed, an important financing instrument that enabled this learning-by-doing to happen in Bangladesh was based on a violation of free market principles. This component was related to the Multi-Fibre Arrangement (MFA) that the USA negotiated to help its own garments and textiles industry in 1973, administered by the General Agreement on Tariffs and Trade (GATT). MFA set bilaterally negotiated quotas on established developing countries exporting textiles and clothing to protect the US garment and textile industry. As a concession to global opinion, the MFA did not put quotas on a number of least developed countries like Bangladesh which did not have any garment industry at the time and were therefore no threat to the US (Goto 1989). For Bangladesh, it was fortuitous that just at that time a potential investor class was emerging. These investors did not have the requisite tacit knowledge to be globally competitive in garments production despite the low wages in Bangladesh. The MFA created 'quota rents' for countries like Bangladesh and thereby helped to finance a period of learning-by-doing. Once established garments exporters like South Korea hit their quotas, newcomers could sell their products at a slightly higher price, thereby enjoying a 'quota rent'. The quota rent served as a partial financing instrument that temporarily reduced the cost of financing learning in the Bangladesh garments industry. And finally, the clientelistic authoritarianism characterizing the ruling coalition of the time enabled a good enough growth-stability trade-off for the introduction of a few critical domestic institutional innovations required for the takeoff of the garments industry.

The MFA created a serious problem for established producers of garments in countries like South Korea who suddenly found themselves quantity-constrained. They had a strong incentive to relocate production to countries that did not have quotas so that at least their textile output could be marketed. But developing countries that did not already have a textile and clothing sector were relatively poor countries that lacked the tacit knowledge to set up competitive production even though their wages were much lower. Moreover, they suffered from market failures that affected the financing of acquisition and learning. To attract investors from more advanced countries who wanted to relocate, developing countries had to offer something more than just their quota-free status. After all, many poor countries were quota-free but only a handful benefited from MFA. Bangladesh was one of them and its success has to be explained in terms of specific mechanisms through which these market failures were addressed.

By the late 1970s, primitive accumulation had created numerous potential investors for a sector like garments where the minimum efficient scale of investment was at most in the hundreds of thousands or low millions of dollars. Technology transfer came about in Bangladesh through collaboration between a retired Bangladeshi civil servant turned entrepreneur, Nurul Quader Khan, and a South Korean multinational, Daewoo. The Bangladeshi entrepreneur set up Desh Garments in 1979, acquiring the land and machinery with its own capital and arranging government support for the requisite institutional changes required to support a potentially risky investment in a new area. The South Korean multinational advanced the cost of training a critical number of supervisors and managers, but this advance was effectively a loan that was to be repaid in the form of a claim of a percentage share of future exports. Daewoo's up-front investment was to host the visiting Bangladeshis at their plant in Busan and

train them in modern garment manufacturing processes. Effectively, what was being transferred here was the tacit knowledge of setting up the plant, managing quality control, minimizing wastage of raw materials, managing time-keeping and all the other aspects of factory production that determine the difference between profit and loss in a competitive world where every quality of garments has an international price that is predetermined.

The role of the quota rent was to reduce the competitiveness gap that a new entrant like Bangladesh would have to immediately overcome. But the quota rent was clearly not sufficient for Desh to simply set up its factory and start production. Further investments in learning-by-doing were necessary and these were organized by the private contract between Desh and Daewoo. However, the quota rent reduced the mountain that Desh had to climb and made it more credible that the Bangladeshi company would be able to learn enough to be able to begin paying back Daewoo's up-front investment relatively rapidly. Moreover, the fact that a retired civil servant from Bangladesh could sit across the table from a global multinational and offer credible equity to set up a collaborative venture can only be understood if we remember the primitive accumulation that the country had just gone through. Daewoo's calculations were straightforward. Bangladesh's access to the US market through MFA was an attractive business proposition which would enable them to market their textile output. But they would probably not have been willing to take the risk of participating in a Bangladeshi collaboration without a number of factors that reduced the risk of failure.

The equity invested by the Bangladeshi firm came from internal financing by the investor and provided commitment that the top management at least would put in high levels of effort in raising competitiveness rapidly. This reduced the institutional requirement of enforcing contracts between outside investors and stakeholders within the firm who would be expected to put in high levels of effort in learning. No less important was the explicit support provided by President Ziaur Rahman to the project. President Zia's support had credibility because it was his initiative to link up Nurul Quader with Kim Woo-Choong, the chairman of Daewoo. His support assured the South Koreans that unexpected institutional problems would be dealt with or at least addressed. This political support ensured that relatively small but critical institutional innovations like the back-to-back LC (which allowed Bangladeshi producers to borrow from local banks to finance their imports of raw materials using their export orders as collateral) and the bonded warehouse (which allowed complex customs duties on imported inputs to be avoided) were quickly introduced. The president had sufficient control over the (clientelistic authoritarian) ruling coalition to implement discrete institutional changes like these without significant modification or cost in terms of political stability. Interestingly, the owner of Desh Garments, Nurul Qader Khan was a civil servant who had made his money in the previous Awami League regime. Zia's objective in supporting him was clearly to develop the economy, not because he was a political client of his own party.

Desh was remarkably successful. Between 1981 and 1987 its export value grew at an annual average of 90% (Rahman 2004). The learning and transfer of technology that was unleashed by this single project was remarkable. By the end of the 1980s, of the 130 people who were first trained by Desh in Daewoo's factories in South Korea, *115 became entrepreneurs* and set up their own garment firms (Rhee 1990: 341). This

apparently did not do much damage to Desh, whose output continued to grow at close to one hundred per cent per annum during this period. The loss the company suffered when it lost a manager was made up many times over by the high levels of effort that these individuals invested in the first place as a result of this implicit incentive. From virtually a zero base in 1980, by 2005 there were around 3500 active firms in the garments sector employing upwards of 2 million people (World Bank 2005). Primitive accumulation continued to be an important source of entrepreneurial supply. In a survey carried out in 1993, 23% of garment factory owners responded that they had originally been civil servants or in the army (Quddus and Rashid 2000). We can assume that many others had close contacts with politics and had made their initial capital through political processes.

The rapid emergence of Bangladesh as a garment exporting country is shown in Table 1. Exports grew at double digit rates for more than two decades. By the early 2000s, the sector accounted for around 70% of Bangladeshi exports. By 1985, such was the success of the Bangladesh garment industry that Ronald Reagan negotiated quotas for Bangladesh under the MFA (Rashid 2006). Bangladesh has continued to benefit from preferential treatment, particularly in European Union markets, but effectively, the first five years of quota protection were enough to trigger a major shift in the country's technological capabilities. By the 2000s the garments and textile sector in Bangladesh was globally competitive without the need for additional protections. Clearly, this was a case where an initial competitiveness gap was met by protection and financing of learning in a way that achieved eventual success and a globally competitive industry. The industry continued to grow through the global recession of 2008 as the lower end of the garments and textile industries gradually began to relocate to Bangladesh from China as its wage costs and exchange rate appreciated in the late 2000s.

Table 1 Bangladesh Garments: Growth Rates of Dollar Exports 1985-2006

Year	Woven	Knitwear	Total Garments Dollar Export Growth Rates
1985-1990			45.9
1990-1995			24.1
1995-2000			14.3
2000-01			11.7
2001-02	–7.1	–2.5	–5.7
2002-03	4.3	13.3	7.2
2003-04	8.6	29.9	15.8
2004-05	1.7	31.3	12.9
2005-06	13.5	35.4	23.1

Sources: (based on Mlachila and Yang 2004: Table 1; World Bank 2005: Table 1).

The rapid growth of the garments industry has meant that the share of manufacturing in GDP in Bangladesh had become comparable to that in India by the turn of the century. Indeed, the share of manufacturing in Bangladesh is higher than is expected given Bangladesh's overall economic characteristics (ADB 2007: 294). But the bulk of Bangladesh's manufacturing is labour intensive and low technology. Moreover, globally competitive production is almost entirely specialized in garments even three decades after the country's breakthrough in this sector. This is indicated by the fact

that around 70 per cent of the country's total export earnings still comes from the garments sector in the 2010s. Moreover, the challenge for the Bangladeshi garment industry is to move up the value chain as it continues to be dominated by the lower value-added segments that depend on low wages to be globally competitive.

The history of the first phase of the garments industry has important implications for Bangladesh as it attempts to move higher up the value chain. Much of its growth so far has been at the lower ends, even though there is evidence of growing backward linkages and diversification. By 2005, roughly 45% of export value was value added in the domestic economy due to growing backward linkages in spinning, weaving, dyeing and accessories (Bhattacharya, et al. 2002; World Bank 2005; Ahmed and Hossain 2006). The story of the first phase of the garment industry's success tells us that market failures constraining learning were overcome through very specific policy and governance arrangements. The blocks of capital required for the next stage of upgrading are much larger and primitive accumulation cannot be relied upon to provide these investments. A survey of the garment sector in 2007 revealed that the available terms of financing were an important constraint to technology upgrading in the sector (Khan 2008a). Banks were willing to lend but the fixed return and collateral requirements meant that investors were only willing to borrow to invest in segments of garments they were already competitive in. They were deterred from investing in new sectors where they were not sure about the length of time learning would take. The sharing of risks and returns across a number of investors could in theory address this problem, but in the absence of an overall rule-following contracting structure, economic organizations could not credibly commit to reveal profits or pay dividends in the future, making these market solutions fail.

Our interpretation of the causes behind the rapid growth of the garment industry in Bangladesh casts doubts on the argument that Bangladesh's success was based on open markets, cheap labour and labour market flexibility. It is true that Bangladesh scores higher than India on labour market flexibility (it is easier to fire workers compared to India) and indeed both Pakistan and Bangladesh often score higher than India on the overall ranking of 'Doing Business Conditions' of the World Bank. But the specific mechanisms through which the garment industry developed suggests that cheap and flexible labour by itself did not help Bangladesh much before the market failures constraining investment in the sector were overcome. Moreover, the persistence of cheap and flexible labour has not helped investment in the next stages of the value chain even though wages have remained low. The implication is that further movements up the value chain will depend on solving specific market failures. The break that was provided by the MFA cannot be relied on for other sectors or for moving up the value-chain in garments and textiles. The Indian experience in automobiles and pharmaceuticals also suggests that if market failures impeding capability development and technology acquisition can be addressed, low wages and excessive labour market flexibility are not even necessary conditions for manufacturing success.

Market Failures and Institutional Solutions in the Garments Industry

The standard economic explanation for the breakthrough in garments is that this growth was based on comparative advantage and flexible labour markets in Bangladesh. But this is not entirely convincing. Why did Bangladesh's comparative advantage in labour intensive industries not emerge before 1980? There do not appear

to have been any significant labour market or other reforms exactly around that period. Nor did any other labour intensive industries take off in quite the same way. Clearly, there were market failures that had prevented the acquisition of technological capabilities even in the least technically sophisticated types of manufacturing like garments. It is widely recognized at least by economic historians that the MFA may have contributed in some way to relaxing some of these market failures, thereby allowing Bangladesh to enter this market. But what type of market failure did the MFA address? The answer to this question has significant policy implications for countries like Bangladesh if they want to devise policies to move into other sectors of manufacturing, labour intensive or otherwise. In particular, can the experience of the Bangladesh garment industry under the MFA be fitted into the metaphor of 'discovery' suggested by Hausmann and Rodrik (2003)? Perhaps entrepreneurs had not invested in trials in new sectors fearing that their discovery rents would be lost if new entrants rushed in. In that case the role of the MFA may have been to reduce the cost of trials, resulting in discovery. The type of market failure that was solved is critical both for a proper analysis of what happened in this sector, but even more for designing institutional solutions that can help with the emergence of new sectors.

The discovery analysis of Hausmann and Rodrik suggests that investments in new sectors in developing countries are blocked because investors have to first invest to 'discover' the sectors in which the country has comparative advantage. However, they may not want to do this because any rents they may earn by discovering profitable sectors will be rapidly eaten away by imitators rushing in and pushing up wages. If this is the market failure constraining investments, it can be solved by governments subsidizing trials, so that the first investors do not face high risks which need to be compensated by the promise of future rents. The problem with this apparently plausible explanation is that deeper reflection suggests that it is very unlikely that countries simply have a comparative advantage in some low technology sectors and not others. Why should countries have such intrinsic capabilities of being more efficient in producing hats relative to bed-sheets? Indeed, the MFA was not a fund that allowed many 'trials' to be organized through which Bangladeshi entrepreneurs discovered what the country was good at doing. The MFA created rents in just one sector, garments. It brought in just one South Korean company, Daewoo, in collaboration with one Bangladeshi entrepreneur who set up just one factory called Desh Garments in 1979. Everything followed from that. If this was really a case of a singular trial that discovered a huge latent capability in Bangladesh, it would truly be a case of incredibly good luck. The coincidence would be even more remarkable because somewhat earlier in its history other 'trials' were conducted in Bangladesh, often assisted by public policies of protection and subsidy. These ranged from protection and subsidies for production in moderate technology sectors like textiles and chemicals to low-technology sectors like leather products and agro-industries but no other sector like garments had emerged. Something rather special was going on in the singular trial organized by the Desh-Daewoo investment.

A more plausible explanation and analysis is possible using our learning approach. The learning approach suggests that low-wage countries like Bangladesh could potentially engage in many different types of labour-intensive or low technology activities and achieve global competitiveness. What constrains them is the absence of the appropriate tacit knowledge. The absorption of tacit knowledge requires investments in learning-by-doing and while the learning is being absorbed, investors

will not be making profits. The fundamental problem is that if sufficient *effort* is not put into the learning exercise, the investments in learning are wasted. The reason why other trials failed is because inadequate effort was put in. It is not plausible that Bangladeshis had no innate capabilities to produce any of those other labour-intensive products. It is more plausible that other sectors did not develop because appropriate financing arrangements for learning-by-doing were not set up in those sectors that also created strong incentives and compulsions for high levels of effort. So the really interesting question is: what was the structure of incentives and compulsions that ensured high levels of effort in this particular project?

The role of a partial public financing or risk sharing in the learning exercise is that without this, the risk facing private investors in sectors requiring learning may be too great. Nevertheless, as we have seen, if initial capabilities are high enough and effort can be assured, private financing of learning can well drive capability development. On the other hand, public financing of learning may fail and has often failed in the past, if effort is not forthcoming. The key determinant of success in the learning explanation is *effort*, not the source of the financing. Effort depends on the governance agencies and the broader conditions determining the enforcement of the different types of contractual arrangements through which the financing for learning is provided. This is very different from the discovery analysis, where public financing of discovery is important because the market failure stems from a positive externality that results in a loss of rents for the successful entrepreneur after a successful sector or capability has been discovered.

This does not mean there are no positive externalities in new start-ups, but in many technologies, these positive externalities are minor and need not, on their own, prevent investments. Compare the risks for the investor coming from the difficulty of ensuring high levels of effort with the potential losses that could follow as a result of positive externalities. The risk that follows from the difficulty of ensuring effort is that private financiers cannot predict *ex ante* how long it will take to achieve profitability. This is not because innate capabilities are not known, but rather because success in enforcing effort is difficult in most developing countries where typically investors cannot fully rely on either formal contracting or informal enforcement mechanisms. The more confidence investors have in their own abilities and in the relevant governance agencies that can enforce contracts, the less important the cost-sharing with government becomes. We see strong evidence in support of this argument in the garment sector in Bangladesh.

The risk involved in learning is highest for the first investors because tacit knowledge is most difficult to adopt and adapt when it is not known locally. But once the tacit knowledge has been transferred to a locality, it becomes relatively easy for other producers and investors to understand the routines. Once the knowledge becomes ‘local’ subsequent investors take a lesser risk. The routines are now locally known and *can be observed in operation*, benchmarks of effort exist and one or two key personnel can even be poached from successful enterprises The required learning becomes less and less risky and uncertainty about learning times reduces dramatically. One indication of the dramatic reduction of risk when tacit knowledge becomes ‘local’ is that local commercial banks suddenly become willing to lend because the required ‘investment in learning’ can now be more readily quantified. Yet the same banks may be very unwilling to play a ‘developmental’ role by coming forward to

finance learning in sectors where the tacit knowledge does not exist locally. This is exactly what we observe with banking practices in the Bangladesh garments industry. These are positive externalities of the first successful learning exercise in the sector, but this knowledge is almost a public good because the loss to the first investor can be rather small, and too small to explain why investments do not happen in the first place. Again, there is strong evidence of this in the Bangladesh garments industry.

The real constraint on the first investors is that they take a big and unquantifiable risk because the transfer of the first tranche of tacit knowledge is most exposed to the uncertainty that existing institutional and contractual arrangements may fail to enforce adequate effort. The entry or otherwise of subsequent imitators has no plausible bearing on this calculation even if minor positive externalities exist. Their appearance is not likely to have any significant effect on profits in labour surplus economies. The Desh-Daewoo investment performed a vital function for Bangladesh precisely because it successfully organized the critical *initial* transfer of tacit knowledge. The MFA helped critically in two ways, but the MFA alone cannot explain the success of the technology transfer process in terms of effort. First, the MFA reduced the requisite private loss-financing by creating quota rents for Bangladesh. By imposing quotas on exports from more competitive countries, MFA allowed follower countries to sell at higher prices once more competitive countries hit their quotas. This implicitly improved the competitiveness of follower countries like Bangladesh for as long as the quotas were in place. Secondly, the MFA created compulsions for the South Koreans to actively seek to transfer some sites of production to countries like Bangladesh. Quotas on South Korean garments exports not only affected their garment industry but also their sales of fabrics and accessories that were indirectly exported through garments. If they could find alternative sites like Bangladesh, they would be able to keep more of their textile industries going. This was the context in which Daewoo was looking for partners in least developed countries to develop a garments industry.

The MFA therefore created a 'public' subsidy for countries like Bangladesh, and incentives for some private foreign investment in learning as well. But all of this would have gone to waste if the firm that was set up failed to put in high levels of effort in learning. Without that, the subsidies for setting up garment firms would be no different from countless other subsidies that have been available for trials in other sectors. We would then have 'discovered' that Bangladesh cannot make garments either. From the perspective of a learning-based explanation of the success of the garment industry, the most critical issue therefore is to understand how high levels of effort were sustained to make this particular exercise a success. We will argue that this can be explained in terms of the features of the interactive variables identified as determinants of effort in Figure 4 and eq. [11].

The important features of the MFA experience in Bangladesh are summarized in Figure 6. The initial capabilities in the garments and textile sector were low in terms of what were required to achieve international competitiveness. There were of course some small-scale operations consistent with a low technology garment industry going back many decades in Bangladesh, but there was nothing on a global scale. The MFA provided an implicit financing instrument for learning by raising global prices of qualities subject to quota. This temporarily raised the competitiveness of quota-free countries like Bangladesh, shown by the higher dotted competitiveness curve that Bangladesh enjoyed with its quota-free access to US markets. To simplify, we assume

that quotas on more competitive garment producers were imposed for all qualities, and that prices for all qualities increased by the same factor. This is obviously not how MFA operated, but the simplified diagram captures key aspects of the story. The implication is that MFA provided a quota rent of s^{MFA} that could serve as temporary loss-financing for firms engaged in learning how to produce quality Q_2 in Bangladesh.

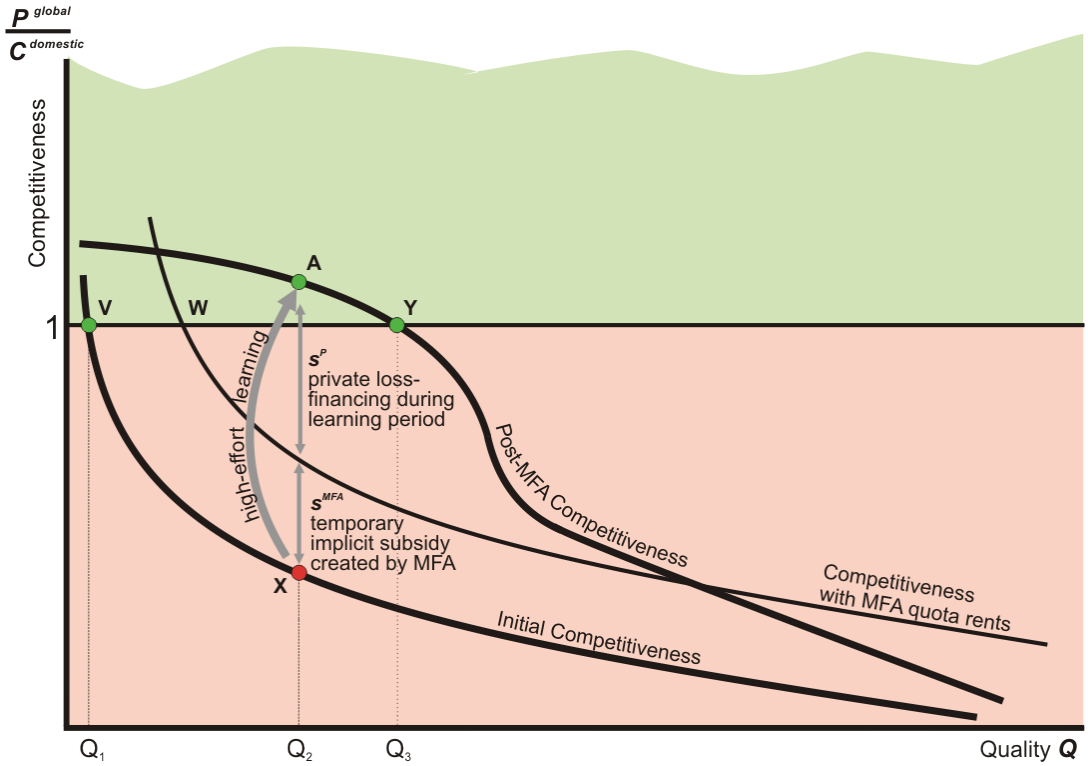

Figure 5 High-Effort Learning under the MFA in Bangladesh

The problem was that even with this improvement in competitiveness, garments operations did not immediately become viable. Tacit knowledge was still too low to enable production of quality Q_2. We know this was the case because significant additional investments in learning had to be financed by the Desh-Daewoo partnership. This is shown in Figure 6 by an initial capabilities curve that is so low that the improvement in competitiveness would have allowed an improvement in qualities from V to a marginally better position at W, but not to Q_2 which we assume is the quality level required for mass export markets. For a significant improvement in prospects, private investment was required to raise capabilities to a globally competitive level at this level of quality. Indeed, while a large number of least developed countries enjoyed quota free access to US markets under MFA but most did not experience export growth. Nevertheless, MFA clearly helped Bangladesh by effectively reducing the competitiveness gap that needed to be bridged by learning financed by private investments.

The Desh-Daewoo partnership began production of quality Q_2 in Figure 6, which represents the quality that could sell in mid-level retail outlets in the US and other global markets. This required a period of partial private loss-financing (shown as s^P in the figure) *in addition to* the 'public' financing (of s^{MFA}) provided by the quota rent that was temporarily made available by the MFA. This private investment was organized by the extraordinary partnership between Desh and Daewoo described

earlier. The characteristics of this contract and its enforcement are interesting because the result was a remarkably successful phase of learning that was in fact concluded faster than the partnership had initially estimated. The overall capabilities in the sector rapidly moved up, allowing not just competitive production of the qualities initially introduced by Desh, but the improvement of capabilities in this region very soon allowed the production to move to somewhat higher qualities like Q_3 as well. Why was this investment so successful in achieving rapid learning?

Effort, Learning and the Success of Desh Garments

The Desh-Daewoo collaboration began in 1979. Desh effectively purchased learning from Daewoo, sending its future managers, supervisors, and some production line workers to Daewoo's Busan plant in South Korea to do the learning-by-doing on site in a working and competitive garments factory. Daewoo was also to assist in identifying the modern machinery that Desh would purchase, provide access to inputs like fabrics at world market prices and provide assistance with marketing the garments using its established marketing network. Daewoo would be making some up-front investments, including hosting and training the Bangladeshi visitors at Busan, but this would be repaid in the form of a royalty of three per cent of sales for the technical training and another five per cent of sales for marketing (Rhee 1990). All investments in machinery, salaries and the project costs in Bangladesh were covered by Desh. Clearly, both sides were taking some risk for an appropriate share of the return. Fortunately, the incentives and compulsions implicit in these contractual arrangements and the degree to which they were enforceable ensured very high levels of effort being put in by both sides.

The collaboration was initially expected to last for five years, but so successful was the learning and technology transfer that Desh was able to cancel the collaborative agreement in 1981, after just one and a half years. Within a year the collaboration succeeded in transferring a large part of the requisite tacit knowledge required to actually produce garments using modern production techniques. The Bangladesh garments industry would not have succeeded if it had simply produced garments using existing capabilities under the protective barrier created by the MFA. The latter may have allowed Bangladesh to produce at the point W in Figure 6, but the removal of MFA would have resulted in the collapse of the industry. The fact that tacit knowledge was actually acquired and brought to the local economy is proved by the fact that *once the new production routines had been established and understood*, many new garments factories opened up in Bangladesh within two or three years and they gradually improved their product qualities beyond the initial levels. Indeed, so dramatic was the growth of the garments industry that the USA imposed quotas on Bangladesh in 1985 just a few years after Desh Garments actually began exporting. But very high growth rates continued beyond the new quota entitlements proving that new competitive capabilities had been established.

The quotas imposed in 1985 on Bangladesh defined the quantities of different categories of garments that could be exported to the US without paying tariffs. These quotas were generous, but for a variety of reasons, many exporters were soon exporting outside the quota, and therefore without benefiting from the quota rent. This was sometimes because some producers were not part of the 'in-group' of the BGMEA, the Bangladesh Garments Manufacturers and Exporters Association that was responsible for distributing the quota between different garments producers. In

addition, quotas for popular lines were soon fully allocated so new producers could not have got an allocation anyway. Thus, within two or three years of the garment industry coming on stream, probably as little as one third of all producers were 'quota protected'. But growth continued rapidly. By the time the MFA was effectively removed in 2007 Bangladesh had a diversified garments industry that was engaged in some amount of backward and forward linkages as well. This evidence suggests that MFA was possibly only important for the first few major investments in the garments industry but these investments were vital in achieving a significant transfer of know-how through learning-by-doing.

In terms of eq. [11] and the relationships between the variables suggested in Figure 4 we can identify a number of fortunate conditions that can help to explain the successful acquisition of technological capabilities by Desh and its transfer to the emerging Bangladesh garments sector. First, the *'financing instrument'* involved in financing the learning-by-doing was a combination of a public 'quota rent' subsidy and private investment in learning, primarily on-site in Busan and subsequently on-site in Bangladesh. This co-financing of learning characterized not just the Desh investment, but also the investments that were made by new entrant companies benefiting from MFA in other product lines in the months and years after Desh started production in Bangladesh. All of these companies were beneficiaries of quota rents and yet had to make relatively uncertain investments in learning to produce different types of garments to global standards. Co-financing in this form meant that the Bangladeshi investor had very strong incentives to put in high levels of effort because the quota rent was not sufficient to achieve global competitiveness with existing levels of capabilities. If the quota rent had been sufficient for Bangladeshi firms to be immediately profitable without exerting any effort in learning, the takeoff would have been immediate without the need for the Busan collaboration. But equally, most of these enterprises may later have collapsed when the quota rents disappeared with the gradual withdrawal of MFA. The partial boost provided by the quota rent proved to be sufficient to induce private investment but also ensured that private investors would only be successful if genuine capability development happened at the outset. This was a very fortunate aspect of the levels of protection provided by the MFA.

Second, the *governance agencies* responsible for allocating the MFA rent were initially entirely exogenous to the internal political structures of rent-management in Bangladesh. Initially, the quota rents were available to every producer exporting garments of the requisite quality. A permanent export subsidy of this type may not have had the desired effect, but everyone knew that there was no reason to expect the MFA to be a permanent feature of the global economy. Indeed, within a few years, Bangladesh had its own quotas and the allocation of these quotas by the BGMEA became important. If quota rents had still been important for learning at that stage, the management and allocation of the quota rents by the BGMEA would have been an important determinant of subsequent learning success. Aspects of the political settlement (in particular the distribution of power between economic organizations within BGMEA and their relationships with political organizations) would have been critical. As it turned out, by the time quota rents began to be allocated by the BGMEA, the core capabilities required for achieving global competitiveness had already been absorbed by the first firms and second and third tier entrants had already started imitating them. New entrants already knew how to become globally competitive on the basis of their private investments in learning, even if they no

longer benefited from quota rents. This is proved by the fact that many *new* entrants after 1985 did not receive any quotas.

In other words, the transition from competitiveness levels of X that had initially characterized the sector to competitiveness levels like A where a firm could be globally competitive *without any quota rent* happened rather rapidly. This transition was based on an upward shift of the capabilities curve from its pre-MFA to a post-MFA position. Once firms learnt how to achieve competitiveness (and they continued to enjoy a significant wage advantage compared to most competitors), they were not afraid to set up production without a quota. It took them slightly longer to turn a profit, but they knew they could do it because the type and extent of effort was known by then. The fortunate aspect of the technologies that were protected by the MFA was therefore that protection was only required to induce learning in the very first firms where the learning was most risky and uncertain. In later cases, the MFA rents were not essential, and therefore the governance structures allocating the MFA rents were not decisive. The core routines had already been transferred to the local economy. This lucky characteristic was related to the simplicity of the technologies involved in the garments industry. For more sophisticated technologies, the 'public' component of the financing for learning may have had to last for longer and the agencies monitoring and governing these investments would be of much greater significance for determining the incentives and compulsions they created for high effort in learning.

The *firm structures* of the early firms involved in the learning were very important for effective learning and high levels of effort. The collaboration between Desh and Daewoo involved significant investments from both sides, but particularly significant from the Bangladeshi side which had to put in most of the capital and effort. The founder of Desh, Nurul Quader Khan provided the bulk of the capital required for investment in plant and machinery for the venture. Daewoo's investment was to invite a large team of Bangladeshis to visit and study its operations in South Korea and understand on-site how production was actually organized. The characteristics of this firm-to-firm relationship and the internal incentives and compulsions within Desh are perhaps the most critical characteristics explaining the success of the technology transfer. On one side was a relatively small Bangladeshi firm led by a motivated investor who clearly had the capability to motivate his team of enthusiastic middle managers. On the other side was a disciplined South Korean conglomerate that had no interest in retaining commercial secrets in a very mature sector, and every interest in rapidly transferring this technology to its new partners. Moreover, the speed with which it would get a return on its investments in training would depend on the rate at which it could transfer tacit knowledge to the visiting Bangladeshis and assist them in transferring this to their production site in Bangladesh. Much of the tacit knowledge was communicated in South Korea in the form of hands-on experience on the South Korean factory floor and the strong incentives on both sides ensured that this was a rapid and rigorous process. It is clear from the subsequent experience of Desh that this hands-on learning experience was decisive for achieving success. Between 1981 and 1987, Desh Garments grew its exports at a staggering average rate of 90 per cent every year (Rahman 2004).

An important factor that also helps to explain the high levels of effort of the early Desh managers is that they believed that one day they could become garments entrepreneurs on their own. The relatively insignificant scale economies in the sector

made this a credible hope. Motivated managers and even supervisors could expect that if their learning was successful, they could one day become an owner themselves. Desh, the pioneering company of garments production in Bangladesh, did nothing to deny this possibility. To its credit, it realized that the motivation of its staff was more important than trying to internalize all the positive externalities of its investment in learning. Perhaps, it also recognized that the clustering effect of many garments factories would be an advantage for itself. Even today, high levels of effort in the best garments factories in Bangladesh are sustained by entrepreneurial motivations of middle managers who work hard to continuously upgrade processes within the firm with an implicit incentive that this know-how could eventually be advantageous for them. Of course, the nature of the technology was important for sustaining these incentives. The relatively easy transferability of the routines required to maintain competitiveness meant that Desh could sustain its breakneck growth despite the turnover of managers. As long as some continuity could be maintained between generations of managers, Desh and later other garments factories could continue their growth despite losing some managers. Moreover, many routines became embodied in the workforce where turnover was much slower in percentage terms. These characteristics of the technology and therefore of the firm structures they supported are important for understanding the incentives for high levels of effort

The technology of the garments industry was therefore fortunate in several respects. However, this should not be taken to mean that the tacit knowledge involved in this industry was very simple to absorb. Before Desh there was no medium-to-large scale modern garment industry in Bangladesh. Even after the routines became local knowledge and were widely imitated, the failure rate in the industry was extremely high. Published figures for failures are not available but industry insiders suggest that between thirty to forty per cent of early start-up firms failed to survive. The knowledge required for success is not just about how to set up the factory floor, but also how to manage a complex service relationship with demanding buyers and difficult supply chains in a changing environment. The critical point is not that tacit knowledge was not important here, but rather that features of the technology and firm structure provided very strong internal incentives for effort. In sectors with significant scale economies where managers could not expect to set up their own firms in a few years, internal firm incentive structures motivating middle management would be extremely important.

The success in sustaining effort in the early stages of learning was also assisted by features of the *political structure* that characterized Bangladesh at that time. The late 1970s were a period characterized as clientelistic authoritarianism. The new government wanted to undo the economic damage done by the ‘socialist’ experiment under the previous dominant party period. The abandonment of the attempt to create a one-party state had important implications for strategies of pushing through pro-business institutional reforms on a piecemeal basis. A one-party state or even a dominant party in a competitive political system has to try and accommodate every political organization that has significant power. The downside of this is that there are contrary interests within the dominant party and decisions that hurt any powerful internal organization or faction are likely to be successfully blocked. The clientelist authoritarian strategy of political management was different. Powerful organizations were encouraged to compete outside the ruling coalition and only a subset of these organizations was selectively accommodated within the ruling party. This meant that

there were fewer centres of opposition to policies within the ruling party and in particular, weaker organizations that were not necessary to the ruling coalition could be excluded and ignored. A range of organizations who may otherwise have objected to the pro-business strategies of the new regime, and who may have demanded high payoffs to enable the implementation of these institutions and policies, could now be overruled or ignored without significant political cost.

The new political structure played an important role in allowing the leadership to focus of a small number of targeted reforms that did not significantly affect established interests, but which could not be blocked by powerful political organizations looking for a share or the rents. President Ziaur Rahman backed the Desh project at the highest level and was instrumental in introducing Desh to the South Koreans. He also backed the introduction of vital institutional innovations like back-to-back letters of credit which allowed firms to import raw materials on the basis of their export orders and of bonded warehouses that allowed duty-free imports of inputs designated for re-export after processing; thereby freeing garments manufactures from complex customs payments and reclaims. The perception that these institutional changes would not be held back by internal political obstruction was important for encouraging both the Bangladeshi and South Korean investors to begin investing even before the institutional problems had been fully resolved. On a broader front, the changes in the political settlement meant that political organizations that may have sought to block these changes in the name of 'socialism' or as a bargaining tool to extract concessions were now excluded from the ruling coalition and were unable to do so. Thus, the new political structure was important for enabling investments and institutional changes that made the new sector potentially viable if learning could be organized. The changed political settlement therefore significantly increased the likelihood that stakeholders would invest significant effort in learning rather than simply using investment in the sector as a strategy of short-term rent capture in the presence of quota rents.

The clientelistic authoritarian political settlement allowed the introduction of required institutional innovations like back-to-back letters of credit and customs rules that allowed bonded warehouses. The new income flows (rents) that could be potentially captured as a result of these institutional changes were not essential for the ruling coalition for two sets of reasons. First, the amounts involved were initially small and secondly, the new ruling coalition did not attempt to include all political organizations and therefore it had relatively more limited internal rent requirements compared to the previous one-party state. As a result, the new institutions were not significantly modified due to significant rent-diversion by powerful organizations nor did their enforcement face strong resistance from political organizations that were deprived of a share of these rents. Moreover, the quota rents created by the MFA were obviously not domestically created and the global institutional arrangements on which they were based could not be significantly modified by domestic political organizations. The quota rents could only be captured by garments exporters in certain categories and Bangladeshi political organizations could not determine the allocation of these rents through domestic institutional modifications. Once quotas were introduced for Bangladesh in 1985, BGMEA became responsible for allocating quotas across its members. However, the BGMEA was relatively successful in allocating quotas according to historical export performance so that politicization did not become excessive. These favourable background conditions, partly based on the international

institutional origin of some of the rents and the political settlement that ensured that complementary institutional changes were not significantly modified combined to ensure that the rents available to the garment sector in its early days created the right incentives for effort in learning.

Thus there were good reasons at the micro and macro level why the configuration of incentives provided by the MFA quota rents, private financing, the nature of the technology and the associated firm structure and finally political conditions interacted to sustain high levels of effort in the learning process. The outcome was by no means accidental even though all these variables were not designed by policy to be compatible and achieve a high-effort learning result. In sectors where the technology is different, where accidental trade-related rents do not exist to the appropriate extent, or where political conditions prevent critical incremental institutional changes that support investment in a sector, it may be much more difficult to create new financing instruments and governance structures that ensure high levels of effort in learning. This explains why devising effective instruments for financing development has proved to be so challenging in developing countries and why financing instruments for new sectors have frequently achieved poor results.

From a policy perspective, it does matter whether the success of the garment industry was based on 'discovery' or 'learning'. If the absence of effort in learning explains the failure of previous trials, then carrying out a number of further trials using public funds is unlikely on its own to 'discover' further sectors like the garments industry. What is needed is policy that can invest in the transfer of tacit knowledge in other sectors *and ensure effective learning through high levels of effort*. Subsidies without mechanisms of enforcing high levels of effort in the experimentation and adaptation that constitutes learning have failed in the past and are likely to do so again. The Desh-Daewoo experiment succeeded because it achieved high levels of effort, and the policy lesson is to try and design further rounds of learning with appropriate financing instruments and associated conditions that ensure similarly high levels of effort.

The metaphor of discovery may allow us to be too sanguine and argue that failure simply shows that innate capabilities were missing for producing a particular product in a particular country. The policy implication that follows from the discovery metaphor is that we only need the credible capacity to terminate subsidies for discovery in time and try again in another sector. The learning model says that we need to probe more deeply into success stories and design new policies with greater attention to the interplay of factors that determine the level of *effort* put into the learning. The challenge for policy in Bangladesh, even within the garments and textile sector, is to follow up on the implications of the importance of learning and to consciously design policies to accelerate further moves up the technology ladder.

Technology Upgrading in the Garments Sector

More than thirty years after the garment sector's growth began the sector is still rapidly growing. However, technical progress up the value chain and into new technologies has been slow, while lateral expansion multiplying existing types of plants has been very rapid. A number of characteristics can help to explain these features. The MFA gradually declined in significance and no new arrangement of this type emerged for new or more technologically sophisticated garments and textile sectors. In the latter, there was therefore no part-public financing of the learning

process. Secondly, the political settlement changed after 1990 with the replacement of clientelistic authoritarianism with a vulnerable democracy based on competitive clientelism. These changes meant that the private financing need was higher and even more so because the technologies were now more sophisticated and the learning gap was larger. And the political context of competitive clientelism meant that the capacity of the ruling coalition to make targeted and specific institutional changes to support particular technological requirements of catching-up sectors was reduced.

This does not mean that a broadening of the technical base did not happen. There was significant growth in backward and forward linkages. By 2005, roughly 45% of export value was added in the domestic economy demonstrating the growing backward linkages in spinning, weaving, dyeing and accessories (Bhattacharya, et al. 2002; World Bank 2005; Ahmed and Hossain 2006). Discussions with entrepreneurs in the sector reveal a number of systematic problems that are closely related to our analysis of learning. Moreover, with the garment industry accounting for roughly 70 per cent of exports, there is a strong case for greater diversification. This requires transferring lessons from the successful experience of learning in this sector to devise policies for other sectors.

A widespread observation in the industry is that once the learning requirements for a particular technology become known, banks are willing to lend freely (though the real interest rate for investors has been high in Bangladesh). The difficulty is that for new technologies and sectors, banks understandably have no metric for estimating their exposure to risk. In fact the entrepreneurs themselves do not know how successful the learning exercise will be. The fixed interest and collateral requirements of bank loans do deter investors who are not sure how long their learning will take. Nor can the absorption of new technologies be easily financed by profit sharing agreements with outside investors because the latter are deterred by poor guarantees of disclosure, weak contract enforcement and weak mechanisms for compelling effort on firm level managers. Thus, there were significant market failures constraining investments in learning, which in turn constrain the rapid acquisition of new technological capabilities. While supporters of market-enhancing ‘good governance’ argue that this is one reason to improve contract enforcement, the realistic possibility of making a significant impact on contract enforcement in the medium term in clientelist political settlements is very limited. Other governance approaches therefore have to be devised to address critical market failures.

New technologies continued to come in but only when supported by very specific financing mechanisms. One variant driving technical progress in the industry is of enterprising entrepreneurs who are willing to accept high risks and negative returns for an indefinite period. These investors are investing in learning by reinvesting profits from their existing businesses in new higher risk technologies. A second variant that can drive learning in new sectors is when foreign partnerships help to finance investment and learning. As foreign partners cannot rely on very credible contract enforcement, these relationships typically work in developing countries when they are based on established relationships of trust between the domestic and foreign partner. But there is widespread recognition within the industry that if appropriate instruments of financing for new technologies could be developed while ensuring incentives for high levels of effort, the adoption of new technologies and investment in the acquisition of tacit knowledge would be much accelerated.

The companies who were able to absorb the risks of financing investments in technology upgrading using their own retained profits were typically bigger companies with strong modern managements. They had already established positions in other segments of the market that could generate the profit stream for financing learning and technology absorption in new segments of the market. We surveyed technically dynamic firms in the garments sector in 2007 and again in 2011 and found that a gradual technical upgradation *was* taking place based on the reinvested profits of successful firms and the ability of established entrepreneurs in these firms to absorb the risk of learning in incremental new sectors based on the profit stream coming into their established businesses. An example in 2007 was the Bengal Jeans and Bengal Denims group that was moving up into denim manufacture. This was entirely based on reinvested profits, which ensured strong incentives for effort within the firm. The firm achieved 80 per cent of the rated productivity of its new denim weaving machines within a year. But integration across all inputs and differences in costs of inputs meant that Chinese imports of denim with all the transport costs were US$1.50 per yard compared to their internal cost of production of US$1.70. Thus, an implicit internal loss-financing of learning was continuing after a couple of years.

Still the use of the Bangladeshi fabric was viable because the group had its own jeans stitching business and in-house production allowed better quality control and quicker response times for their jeans manufacturing. Moreover, Bangladeshi inputs enjoyed GSP advantages at that time as Bangladesh was an LDC (least developed country) and this gave users of local fabrics a cost advantage of up to 12.5 per cent in some markets. They were taking a bet that achieving scale economies in their domestic production and rising costs in China would eventually make the denim production globally competitive. Clearly, without their integration into jeans production (and GSP privileges) the backward linkage would have been unviable given the time it was taking to compete with the Chinese.

Another example of a modern factory that had become sizable through incremental internally financed investments was Far East Knitting and Dyeing Industries. This had around 1300 workers in low value-added garments making, but the stream of income from that was financing sustained moves into higher value-adding knitting and dyeing. Around 800 workers were employed in these more technically advanced areas in the late 2000s, and these numbers were growing. The company's strategy was to retain 5 per cent of its gross export earnings for reinvestment in technology upgrading. The owners and managers were individuals with a long exposure to western markets, had good relations with buyers and understood how to create incentives for high levels of effort by their workers. The firm had devised internal incentive schemes like a rolling fund where the firm paid in around 300,000 taka every month (around US$5000) which accumulated into a sizable fund over the years. Employees who stayed with the firm more than five years were entitled to a per capita share of the fund when they left, creating incentives for staying on. This was to reduce the perennial problem of leakage of trained workers.

Firms in Bangladesh are obviously aware of the 'positive externality' problem, which means that new entrants or other existing firms have an incentive to poach on the training efforts of firms that engage in skilling up new workers or workers in particular segments of quality. But it appears that firms have adjusted to these positive

externalities and are not excessively constrained by it. A mechanism that is widely used is to force workers to share some of the initial training costs by hiring them as 'helpers' in the first place. They often have rates of pay that are below the market wage because the assumption on both sides is that the training has a value which can be lost to the firm if the worker leaves. The bargaining power of firms in a labour surplus economy has meant that this arrangement has been widely adopted, though the pressure to implement minimum wage laws for helpers became unavoidable by 2010. Clearly, firms can and have misused these arrangements, but it is one mechanism through which the external benefits of training were internalized by the firm in the form of initially lower employment costs.

The other model sustaining investments in new technologies has been partnerships with foreign partners. This requires strong relationships because foreign partners providing some of the capital or technology for upgrading have to be assured that the Bangladeshi firm will put in high levels of effort. Contracts protecting the investments of foreign partners are recognized as being of limited value in the general context of weak enforcement. In the small-scale garments sector where corporate reputation still has limited value, personal relationships and industry knowledge have been very important. An example is K.S. Embroidery where personal relationships between Chinese investors and a Bangladeshi entrepreneur allowed a small investment and some technology transfers in new segments of the industry such as mechanized embroidery.

A potentially very interesting model of foreign partnerships driving technology acquisition is the Danish Business-to-Business (B2B) programme run by the Danish development agency DANIDA in the mid-2000s in Bangladesh (Ministry of Foreign Affairs Denmark 2006). This programme identified viable and reputable Danish companies and introduced them to developing countries and potential local partners with whom joint ventures or partnerships could potentially be set up. The Danish programme vetted high quality Danish technology providers, financed their visit to the developing country and set up meetings with domestic entrepreneurs. Its main purpose was to cover the costs of potential Danish companies to come to a developing country that they do not know and where they might otherwise not have come. In other words, the programme covered the coordination costs but not the direct investment and learning costs faced by the joint venture.

But consistent with our argument of risk, this limited support resulted in new investments in relatively sophisticated technologies. As an example, the International Trade Connection, a Bangladeshi business group implemented a project setting up a composite textile knitting factory at Bhaluka with German and Danish technicians providing assistance in 2007. As a result of the linkages established by the programme, there was also a private Danish investment with a 33 per cent stake in the project. The Danish programme is obviously restricted to Danish companies, and this significantly limits the range of technologies and sources of financing Bangladeshi firms can access. Nevertheless, it is a good example of how relatively small investments in coordination and information provision can help bring about investment in new technologies in developing countries. It is a model that other development partners could consider, and indeed the Bangladeshi government could use some of its own resources to reduce the coordination costs of foreign investors in new technologies.

The characteristics of the Danish B2B programme mean that care would need to be exercised to scale it up. The financing instrument here is a like a public subsidy that reduces the overall costs of investing in new technologies by reducing some of the information and coordination costs. The partial contribution to investment means that private financing of learning is still required to achieve competitiveness. Here the small scale of the programme and the intensive knowledge that the Danish programme coordinators have both of the Danish business they invite and the Bangladeshi businesses they introduce them to means that the business partners start off with some degree of confidence towards each other. The rest is then based on intensive inaction to establish trust and confidence in the mutual business models. As the Bangladeshi side cannot become competitive without an investment in effort, and as the foreign investor in technology knows what is involved in the technology and can help the local company set up the operation, there is once again a mutual incentive in putting in high effort in learning. The political context by this time was less favourable for incremental institutional changes supporting particular investments, but given the very small scale and specificity of these investments this failing did not matter excessively.

By 2011 the garments sector in Bangladesh had become fairly differentiated with some technically sophisticated firms at the top and some very basic technology ones at the bottom and a range of variation between. Some of the more sophisticated firms at the top had gradually progressed to very sophisticated technologies and production techniques. An investigation of a few of the sophisticated firms at the top reveals that some of these firms have achieved a self-sustaining dynamic of technical progress based on the investment of their internal profits for gradual movements up the technology ladder. We look at two examples. Viyellatex Group is a dynamic firm based in Khortoil in Gazipura Tongi near Dhaka. Its history goes back to 1996 when it was set up with 450 workers and six production lines and today employs 14,000 people, with backward linkages into spinning, knitting, dyeing, customized packaging, and accessories including buttons, hangers.

Its chief executive, David Hasanat, does not recall getting any external assistance in building up the company, which has grown based on its reinvested profits. The original capital was entirely a bank loan backed by the collateral of the partners. Clearly, the risk of succeeding in learning was entirely borne by the partners based on their observation of the technical capabilities that other Bangladeshi firms had achieved at that time. In the basic lines on which they initially focused, it was possible to estimate the learning-by-doing that was required. Subsequently, in moving up the value chain and into new lines, their secret was aggressive reinvestment of profits based on a long-term commitment by the owners to build a technically sophisticated company. In 2011 the firm was investing in green technologies to become a carbon-neutral company. The design features were commissioned from the Bangladesh University of Engineering and Technology (BUET), with the design financed by German aid as part of a GTZ project. This company was therefore capable of gradually moving up the quality ladder based largely on reinvested profits and the learning capabilities that the top management had acquired over time.

Far East Knitting and Dyeing Industries had moved on further in 2011. Asif Moyeen its chief executive explained that the company always solved its problems by itself.

The company was making a significant investment in a high technology spinning plant and weaving plant. There had been no government help but neither had there been government expropriation or obstacles set up to enable rent collection. The primary problem for the company in moving up the value chain was power supply and this too had to be solved in-house as in all major garments factories with the development of captive power plants. The company had a gas-based generator but with the shortages of gas it was now building diesel and furnace oil generators. The prioritization of gas supplies to some firms did require government assistance and therefore kickbacks and bribes and for this reason the company preferred to diversify its power sources even at a relatively high cost. The main constraint to the expansion of the company was the dire situation in national power generation and infrastructure.

The growth of the garments industry has obviously resulted in an increased political influence of its two associations, the Bangladesh Garments Manufacturers and Exporters Association (BGMEA) and the Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA). However, the two associations wield less power and influence in national policy-making decisions than the economic dominance of the garments sector in exports and manufacturing may suggest. Shafiul Islam Mohiuddin, second vice-president of BGMEA, describes a relationship with government that suggests a limited engagement between the two sides, either positive or negative. The low rents (profits higher than competitive market levels) that the sector generates possibly makes it less interesting for political organizations, either as a target for predatory activities or as a sector to assist in exchange for a share of its profits. This

The BGMEA was involved in a fifteen-year long negotiation with successive governments to set up a ‘garments village’. The aim was to bring a large number of garments factories together in a cluster, solving the problem of land acquisition and infrastructure facing start-up companies in the sector. The land would be bought by firms locating within the village, but government support was required to acquire the land in the first place. After nineteen meetings with Saifur Rahman, the last finance minister, the government promised a 300 acre park in Kachpur. But at the last minute, the decision was changed to offer the garments industry plots in the huge Adamjee Jute Mills site, which was now empty after the public sector jute mill had been closed down. The problem for the garments industry was that the proposed price of land at Adamjee was too high to be viable. Saifur Rahman offered land at Adamjee at 9.5 million takas per bigha (one-third of an acre in Bangladesh) when land was available at industrial sites like Savar and other areas at around 2 million takas per bigha around 2002-3 (when the exchange rate with one US dollar was approximately 55 takas). Not surprisingly, this long negotiation to solve the locational problems of the industry ended in failure.

At an institutional level BGMEA has some successes to its credit. These include its successful taking over of the functions of allocating Utilization Declaration (UD) and Utilization Permission (UP) certificates, which determine how much cloth per dozen shirts a garment factory is allowed to import duty free. This assessment is technically the function of the Customs department. By acquiring the right to assess and allocate these certificates within the industry, BGMEA reduced the ability of Customs to harass manufacturers but Customs can still occasionally take bribes for conducting the annual audit comparing the aggregate imports and exports of raw materials. The

allocation of these certificates also gives the BGMEA a certain leverage over its member firms that it has used to advantage in its additional role in facilitating arbitration between firms, buyers, workers and buying houses. Arbitration is important in a context where the formal court and legal system is notoriously slow and open to influencing activities. The BGMEA has its own arbitration process and structure, which includes retired high court judges and with its own case law. As the arbitration is done by insiders who know how the industry works as well as its undeclared practices like informal cost and profit-sharing agreements, the arbitration works relatively well. Intransigence on the part of firms who may otherwise have ignored judgements that went against them is mitigated because firms do not want to antagonize the BGMEA as it has real powers in allocating UD and UP certificates.

The BGMEA can also help its members with problems like late payment of utility bills by some factories because of delayed payment receipts from abroad. Without its intermediation and its confirmation that some delays are legitimate, power may have been cut off to some firms. BGMEA guarantees to the power company thus helps to keep some firms in business. The BGMEA has also begun to play a more important role in negotiating government support for the sector during a crisis. For instance, after the 2008 recession, BGMEA lobbying led to government promises of support. For new markets (that is markets outside the USA, Canada and the EU) such as Australia and Turkey, the government offered an export cash support of 5% for 2010, gradually reducing to 0% after 5 years. In addition, small producers whose sales were less than $3.5m, the government offered a two per cent cash incentive for up to 25% of the firm's FOB value of exports or its value-added beginning in 2010. The association also negotiated an exit policy for bankrupt firms in 2010. The policy provided bankrupt firms around seven years to pay off bank loans with government giving implicit interest rate support. The strategy allowed owners of bankrupt firms to avoid bankruptcy certificates that would have prevented them from doing other businesses.

4. The Emergence of the Electronics Sector

Electronics is one of the promising new sectors in Bangladeshi manufacturing with some capacity already developed at the beginning of the 2010s. Its promise lies in the fact that many basic electronic items like fridges, televisions, air-conditioners, CD-players or DVD-players have a relatively significant assembly component that a labour-surplus economy can easily adopt. Moreover, many of the lower-technology parts can also be locally produced. As Chinese wages and exchange rates rise, many of these assembly and basic manufacturing activities will inevitably shift to lower wage countries. Some of the critical components like chips will undoubtedly have to be imported till a much higher level of overall industrialization has been achieved, but there are significant manufacturing and assembly operations that could be done at the level of manufacturing capabilities that exist in Bangladesh. However, this takeoff has to happen in a context where the political settlement already has characteristics of competitive clientelism with weak democratic institutions. Bureaucratic organizations have also become relatively fragmented and uncoordinated and are unlikely to play a coordinated role in organizing support for learning in these new industries. The only counterweight to these negative developments is that some economic organizations have developed sufficiently to be able to finance a gradual process of learning-by-doing by themselves. As a result, we see the same gradual technology adoption

strategies in electronics that we see in the more mature garments firms, with personal assets and profits being used to gradually finance relatively risky learning. The significant difference with the garments industry is that while the latter had a lucky break at its earlier stages due to a more favourable political settlement and fortuitous public financing in the form of the MFA, the electronics industry did not, and therefore has had to accept a slower process of learning and capability development, and therefore slower growth from the outset.

The pioneering company that has led the learning processes involved in introducing electronics manufacturing in Bangladesh (as opposed to small-scale assembly operations that had existed for some time) is Walton Hi-Tech Industries. Despite its name this is a Bangladeshi company that took the unusual step of advertising and marketing its products as 'Made in Bangladesh'. Its marketing strategy reflects the economic nationalism of the five brothers who are its owners. As one of the brothers, Shamsul Alam explained, their mission is not just to make money but also to introduce new manufacturing capabilities into Bangladesh. Indeed, without such a commitment it would be difficult to explain how a company could enter a sector that was entirely new for Bangladesh and take the private risk of financing a relatively long period of learning-by-doing.

The brothers entered business by setting up a trading company in the early 1980s, trading corrugated iron, imported zinc ingots and engaging contract manufacturers to produce the products which they marketed. Their trading company subsequently became involved in importing nineteen electronic items. It was at that time that they began to visit China to see why they could not manufacture some of these items in Bangladesh. Initially the project was totally self-financed, drawing on profits from trading. The construction of the first electronics factory began in 2004 with trial production from 2006. The range of products that are already part-manufactured in its new plant in Gazipur near Dhaka includes fridges, motorcycles, and televisions, with different levels of domestic content. The production of assembled air conditioners is targeted from late 2011 with mobile phones next in the pipeline. The big ambition of the brothers is to produce the first Bangladeshi motor car. Clearly, the range of products that the firm is experimenting with suggests that its desire at this stage is primarily to absorb these technologies and show they can be produced in Bangladesh and this outweighs purely commercial interests in achieving scale economies and high levels of profitability. The company's lasting contribution may therefore be to introduce new technologies to Bangladesh even though it is unlikely to achieve competitiveness across all these different lines.

In 2011 the company employed between 5500 and 6000 workers. Its production was still small, at around 25,000 fridges and around 4,500 motor cycles per month. Its motor cycles were around 20,000 takas ($300) cheaper than similar quality imported ones. Its refrigerators were also somewhat cheaper than imported fridges but in addition its extensive network of retail and service outlets throughout the country ensured that it could provide better after-sales service than its competition in the more basic segments of the market. The motor cycles already had 60 per cent domestic content and the plan was to begin producing engines very soon based on Chinese models. The fridges were entirely manufactured in Bangladesh except for the compressor. According to Walton engineers the compressor was also easy to make in Bangladesh but for the capital investment to be viable a larger scale of production was

required. Export markets were being explored with small trial exports to Qatar, Oman, Myanmar and Nepal. Total exports in 2011 were only around 1500 units but if these markets could be opened up there were good prospects for expansion that could justify the investment in making compressors. The company also assembles cathode ray televisions, with the tubes imported from Malaysia and LCD assembly was due to begin soon using South Korean panels. Clearly, panel making capabilities were far away in the future and there were no plans to attempt this soon. Apart from this, the company was selling Chinese produced mobile phones and DVD players under its own brand name to build name recognition in preparation for the gradual assembly and part manufacture of these items in Bangladesh.

There was some government support in the form of customs duties and taxes that supported domestic production and assembly of electronic items. But this tariff structure had existed for some time without triggering any significant assembly or manufacturing of electronic products. Table 2 shows the duty and tax structure for refrigerators and air conditioners in 2010. The tariff protection together with lower duties and taxes on imported parts provided an advantage to domestic manufacturing and assembly. The duty and tax structure had remained unchanged since before Walton began its operations and the only incremental support that was associated with the emergence of Walton's operations was that in 2009 the supplementary duty (SD) on imported refrigerators went up from 20 to 30 per cent. Shamsul Alam, one of the brothers who owned Walton, plausibly argued that as this policy support had come after Walton had set up all its plant, its production decision had not been contingent on this additional duty support. The additional support probably emerged because the new government discovered that Walton was emerging as a significant manufacturer and supporting it would make economic and political sense. Exports do not get any subsidies but there are duty drawbacks on imported materials that are re-exported.

Table 2 Duties and Taxes on Selected Electronics Imports June 2010

	Refrigerator	Refrigerator Parts	Air Conditioner	AC Parts
Customs Duty CD	25	25	25	25
Regulatory Duty RD	5	5	5	5
Supplementary Duty SD	30	0	60	20
VAT	15	15	15	15
Advance Income Tax	3	3	3	3
Advance VAT	2.25	0	2.25	0
Total	80.25	48	110.25	68

Source: *National Board of Revenue*, Bangladesh.

The tariff structure had clearly not been sufficient for triggering domestic learning, and this is itself a good indication of the initial competitiveness gap. Further evidence that the private initiative to absorb the costs and risks of learning played a critical role in refrigerators comes from the case of air conditioners. Air conditioners received at least as much duty and tax support but were not yet being produced in 2010. Indeed, according to Walton, government policies made air conditioner production more difficult as we discuss later. However, with the loss-financed learning carried out by Walton and perhaps helped by the incremental increase in supplementary duties in 2009, fridge production achieved competitiveness with imported alternatives by 2010.

Walton's 'Made in Bangladesh' fridges rapidly achieved price and quality competitiveness compared to imports. Production is also potentially price competitive in regional export markets though brand recognition is still low and volumes need to increase.

The real protection provided to domestic manufacturing by duties and taxes is in addition significantly less than the nominal rates in Table 2 suggest because customs duties are routinely evaded by under-stating the value of imports or evading duties altogether. After repeated complaints from Walton and latterly other refrigerator manufacturers, individually and through the Bangladesh Refrigerator Manufacturers Association, the National Board of Revenue launched an investigation into undervaluation and dumping. Till 2010, Bangladesh used pre-shipment inspection companies to verify import values at the port of export and granting pre-shipment inspection (PSI) certification. But according to domestic producers, importers were able to by-pass these valuations too. After 2010 the PSI system was abandoned but the problem of undervaluation of imports became even worse with local customs valuation. An investigation by the Bangladesh Tariff Commission (BTC) in September 2010 found that 99% of imported fridges were undervalued (*Financial Express* Nov 2010, Volume 18 no. 12). Repeated pressure from the growing number of domestic refrigerator manufacturers and the reports of fraud resulting from their private investigations is likely to have some effect on the overall incidence of duty evasion by importers.

The sequence through which competitiveness was achieved by Walton in its refrigerator manufacturing suggests that the initial level of duties and taxes was not sufficient for domestic production to be competitive. The gap in tacit knowledge in production and the implicit loss-financing that would be required was substantially greater. Walton's contribution was to see the learning exercise as a challenge, implicitly financing the learning out of its own retained profits from its earlier trading businesses. This is summarized in Figure 6 which shows that private loss-financing was the critical driver in this sector, with government assistance playing a follower role in supporting the initiative. The initial level of competitiveness shown on the lowest competitiveness curve describes the non-viability of manufacturing of products of quality Q_2 even with significant duties and taxes on imported refrigerators. The learning-by-doing in refrigerators was initially financed by Walton taking on its domestic capability development mission. The private loss-financing led to a higher level of competitiveness shown by the second curve in Figure 6. This was initially based on loss-financing but the strong incentives for learning based on in-house financing meant that the competitiveness curve actually rose rapidly towards its intermediate position and loss-financing did not have to continue for long. Competitiveness was further augmented by the additional increases in supplementary duties in 2009. By all accounts, the latter was not decisive in explaining the takeoff, and may have had a relatively small effect because of weak governance capabilities that resulted in the avoidance of duties by many importers of refrigerators.

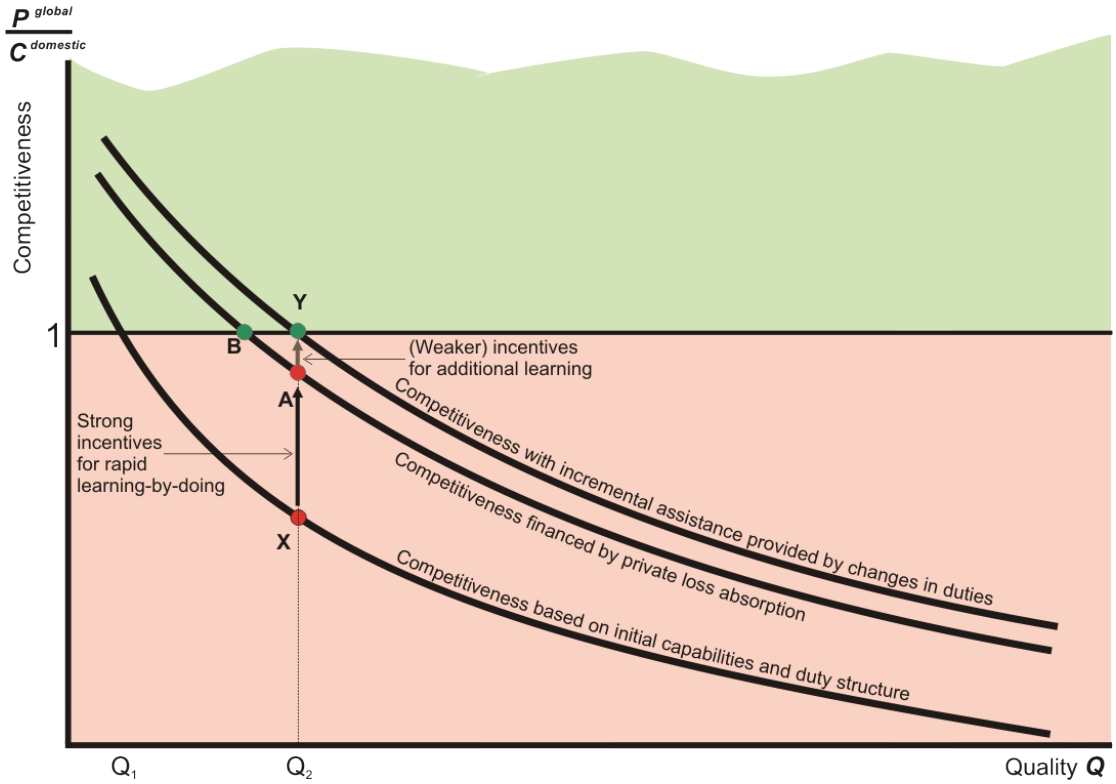

Figure 6 The Financing of Learning in the Electronics Industry

Apart from the direct support provided by government through duties and taxes on particular electronic products, indirect assistance was also provided by a lower income tax on incomes generated by the production of certain products. The Emergency interim government that governed during 2007 and 2008 had recommended that the income tax holidays allowed for sectors like garments should be extended to electronics but left it for the next government to implement. The subsequent Awami League government reduced the income tax imposed on electronics manufacturers from 37.5% to 5% in line with the practice in the garments sector. This could be described as a further instrument for sharing the loss-financing costs of organizing learning in a new sector. In 2009 VAT was also waived on the domestic value added by motorcycle and fridge manufacturers but *not* air conditioning manufacturers. Value added tax at 15 per cent was still payable on the imported material part of the finished product. This was temporary help to these sectors according to the government. Walton played a part in lobbying for these changes and provided the detailed information about imported parts to the National Board of Revenue (NBR) that would need to be provided to calculate the domestic value-added.

These processes show that the government was fairly receptive as a follower and did carry out policy changes. However, lobbying was not always successful. Walton failed to extend the VAT reduction for domestic value-added to air conditioners. Interestingly, this disadvantaged Walton not because the VAT remission on domestic value-added was critical for making domestic production of air conditioners viable. Rather, Walton officers argued that this anomaly meant it could not start producing air conditioners in a unified plant with refrigerators because book keeping of similar parts going into the different products would be difficult. It would be possible for ‘enemies’

to claim that Walton was shifting value-added from air conditioners to refrigerators to reduce its VAT liability. This would create opportunities for the tax bureaucracy to create problems for the company and this was sufficiently unattractive for Walton at that time to slow down its investments in air conditioners.

The role of government was therefore to follow Walton's initial investments in land, plant and machinery with some additional tax and duty assistance, but some of this assistance was not actually delivered because of weak enforcement of customs duties. The overall effect was therefore likely to have been relatively small and is shown in Figure 6 as a smaller but additional upward movement of the competitiveness curve. This additional protection may have allowed Walton to immediately produce higher qualities, like Y in Figure 6 as opposed to qualities like B. The government support for the sector had a number of interesting features. Walton did not achieve favourable policy changes to support its investments *before* it set up its production facilities. The family-owned business claims not to have had close political connections with any political party although it is possible they did have private contacts and access. The absence of close links was possibly fortuitous in the context of competitive clientelism and weak enforcement capabilities of bureaucratic organizations. While Walton's owners were clearly motivated to develop new manufacturing capabilities in the country, opportunities for making easy profits through political connections at the start-up phase of their projects may have created adverse incentives. If anything, bureaucratic enforcement capabilities tended to become weaker during the 'vulnerable democracy' phase of Bangladesh's political settlement after 1990 as a result of a creeping politicization of the bureaucracy[6]. With such weak enforcement capabilities, a government strategy of assisting learning based on committing implicit subsidies *in advance* of investment decisions may have created adverse incentives. Investors may have justifiably believed that official conditions for receiving and using subsidies for learning could be easily circumvented. If so, less serious investors may have entered the field with the objective of capturing subsidies, and they would inevitably put in low if any effort in raising productivity rapidly. The subsidies may then have financed a lasting competitive weakness in the sector.

The sequencing of government support to assist an already established firm that was likely to have become competitive with its own investments was therefore fortuitous. It sustained the incentive structure supporting high levels of effort. In addition, it had a positive effect in inducing additional companies to follow Walton, as we see below. However, the weakness of governance capabilities meant that the assistance was less effective in inducing high levels of effort in learning than it may have been. For instance, the government did not announce a time period for the support or the rate at which support would decline over time. As a result, firms may have been led to believe that the support was indefinite. If they did, they would not put in high levels of effort in learning and the underlying competitiveness curve would then not rise or not rise rapidly enough. In Figure 6 this is shown as a strong learning effect from the internal financing of losses but a weak learning effect associated with the supplementary assistance provided by government. This is because the firms involved in internal loss financing of learning would have strong incentives to put in high levels of effort to raise their underlying productivity to reduce their loss financing. The higher productivity would allow loss financing to be reduced without the

[6] See the companion paper to this piece, *The Political Settlement and its Evolution in Bangladesh*

competitiveness curve declining. However, the learning effect from the supplementary policy support may be relatively weaker as some firms may see this support as indefinite. Their effort to move the actual competitiveness curve higher would then be adversely affected. In that case the higher position of the competitiveness curve would only remain as long as the implicit subsidies were there, with a decline in competitiveness with the removal of support.

The weak design of additional government support can be attributed to weak governance capabilities in these areas. A time bound or declining set of supplementary duties (which may also have been initially set at a much higher level) would have required stronger governance capabilities to track and implement. They would also have required a credible distance from political interference in the future to ensure that effort was expended by firms in raising productivity and not in persuading government to change the terms of the support. With stronger bureaucratic enforcement capabilities, government could also have provided more direct support with loss financing in learning sectors. For instance, Walton's finance director identified the cost of financing as a critical constraint for their learning efforts. If government could devise targeted financial instruments that provided low cost loans for financing operational costs during the learning phase, this would be a critical policy instrument that could assist firms to move rapidly up the value chain. But such financing instruments would require specific governance capabilities on the part of the state to ensure that the financing came with credible conditions and was monitored and regulated effectively.

Following Walton a number of other firms involved with the import of refrigerators found that their traditional business was at risk with the rapid success of Walton's product. These firms then moved rapidly into domestic manufacturing to preserve their cost competitiveness with Walton, particularly after the changes in duties and taxes that followed Walton's emergence on the scene. The companies affected were the more significant players in trading who would be much less inclined to engage in significant and sustained duty avoidance activities, and who already had some capabilities in assembly and manufacturing. The dominant second-tier followers in manufacturing were Butterfly, MyOne and Transcom.

Butterfly Marketing Ltd, as its name suggests, was primarily a seller of electronics products, and one of the largest electronics distributors in Bangladesh. It took its name from the Butterfly brand sewing machines from China that it used to distribute in the late 1980s. It kept its name even after it moved into other products, with a focus on electronic items. From 1995 its business began to be dominated by its partnership with the South Korean chaebol LG when it became its distributor, managing the process of local pricing, marketing and after sales service for LG products in Bangladesh. The entry of Walton into local refrigerator manufacturing reduced the prospects for imported brands and induced Butterfly to look into domestic production. In 2010 it was engaged in a partnership with Hisense Group of China in a joint venture to produce refrigerators in Bangladesh. Hisense would have a thirty per cent stake and provide the compressors. The rest of the refrigerator would be domestically manufactured, as in Walton. Production was projected to begin by end 2011 and the company believed that exports to Myanmar, Laos and maybe even to China were possible and necessary to make the enterprise profitable. The investment in this project including the cost of land was around twenty million US dollars and the

projected output was around 200,000 units per annum. Raising the financing was not a problem with banks because of the brand name of Butterfly. As in the case of garments, once the first significant firm had established itself and shown that the learning problem could be overcome and a competitive product could be produced within an acceptable timeframe, the risk for external financiers fell dramatically and follower firms did not have the same problems in raising finance.

Butterfly was also moving into the assembly of colour televisions and air conditioners with LG. The full local production of colour televisions was not yet possible because this required a broad range of local component suppliers and these industries had not yet developed. The move into television assembly was also prompted by changes in the domestic market of a different kind. Higher quality imported televisions were being competed out of the market by low quality assemblers who imported colour and black and white tubes from China, Malaysia and India and then assembled them in boxes with ancillary electronics. An imported fourteen inch LG colour television cost 9000 takas in 2011 (around 130 dollars) with all taxes. In contrast, assemblers could often evade the (lower) import duties on components and sell a similar sized television for less than half this price at around 4000 takas. Interestingly, here the lower duties on components and the weak governance capabilities of enforcing even these lower duties on smaller companies importing tubes and components created pressure on a large formal-sector distributor like Butterfly to move into its own assembly operations with LG. It could not hope to achieve the prices that the unbranded assemblers could offer but by reducing the price gap on a branded television, it hoped to increase its market share. However, as Butterfly's management pointed out, they were limited to assembly operations as far as televisions were concerned because of the limited development of the domestic component industries.

MyOne Electronics Industry Ltd. also started life as a trading company in 2001 and gradually moved into assembly operations. This was primarily due to a duty and tax structure that encouraged assembly. As early as 2002 the company was assembling black and white televisions. The import of a finished TV faced overall duties and taxes of 78 per cent, but the picture tube on its own faced 32 per cent, the cabinet 52 per cent, and the printed circuit board (PCB) 78 per cent. If the PCB came unfinished the taxes were further reduced to 32 per cent. The average duties and taxes on imports of components were therefore around 40 per cent and the difference with a total of 78 per cent on fully assembled imports provided the margin that allowed domestic assembly operations to begin. Domestic value added was around 25 per cent. After two years the PCB was also brought in unfinished further improving margins. Production was initially around 100-120 pieces per day growing to around 200 to 220. But the assembly of black and white televisions has now stopped as a result of changing consumer demand. The assembly of colour televisions began in 2005, with current production around 400 sets a day. The company also assembled DVD players and voltage stabilizers using imported Chinese components. MyOne was the market leader for television sales in Bangladesh in 2011 with 33 of its own showrooms, a further 150 exclusive franchise showrooms and another 200 or so dealers who stock their products along with other brands. It was finishing the construction of a new factory in Gazipur that would begin production in 2011 assembling colour televisions and LCDs. The domestic manufacturing part was limited to cabinets with all electronics components being imported. The investment in the new factory amounted to almost 3 million dollars, excluding the cost of the land. MyOne also planned to

assemble air conditioners in the future given the duty and tax differential on imports of components compared to finished products.

The experience of MyOne and Butterfly in assembly operations suggests that the learning required to achieve competitiveness in assembly was very limited given the duty and tax structure. However, assembly operations for televisions and air conditioners were very different from the manufacture of refrigerators because the domestic value added in actual manufacturing processes was much lower in the former. The risk involved in learning and the investment by the firm in learning-by-doing were correspondingly lower. The competitiveness gap with imported products could be fully met by the tax and duty differentials on imported components and imported finished products. The importance of the duty and tax differentials for assemblers meant that they had a strong incentive to monitor tax avoidance and report avoidance to the authorities. According to the Managing Director of MyOne, Razzak Khan, the Bangladesh Electronics Merchandisers Association and Bangladesh Television Manufacturers Association and others monitor the market and report suspiciously cheap imports to intelligence and other agencies. Government finds it difficult to keep ignoring persistent reports about specific illegal importers and they are eventually forced to stop. This was a more favourable assessment of current enforcement capabilities compared to that of Walton and Butterfly.

It was certainly the case that the implicit subsidy to assemblers based on differential duties and taxes on parts compared to the finished product were sufficient, even allowing for partial enforcement, to allow domestic assembly to achieve competitiveness. Undoubtedly some learning-by-doing followed in the large assembly factories that were being set up by Butterfly, MyOne and other assemblers. We would also expect this learning-by-doing to have some long-run impact. But it has to be seen if the companies involved in assembly see the duty and tax protection as temporary and put in enough effort in the learning process to ensure that eventually assembly operations can be competitive even in the absence of duty and tax differentials on components. This may not be possible at all if components prices in international markets available to small scale assemblers in Bangladesh precluded the assembly of competitive finished products. This would be the case for instance if producers of finished products in more advanced countries produced many of their own components at a lower internal cost of production than the international price or could buy components at a significantly lower price from components suppliers because they could buy on a greater scale or were in long-term relationships with them.

The Managing Director, Razzak Khan, was very aware of the limitations of assembly operations as a strategy of moving up the value chain in electronics. Indeed, he argued that a substantial change in the orientation of the Bangladeshi electronics industry was required if it were to achieve sustainable competitiveness in some sectors. The domestic market for electronics in Bangladesh would remain relatively small in the near future (despite its very large population) and therefore manufacturers could not hope to achieve significant economies of scale by focusing on protected domestic markets. At the same time it was difficult for Bangladesh to compete in international markets with countries like China which had an integrated components industry. It would be difficult to enter large-scale production of say televisions without a diversified domestic components industry, which in turn could not develop without a diversified range of final electronics products being produced. It was therefore not a

viable strategy for Bangladesh to try and move towards the full production of finished products like televisions. Rather it should focus on a few more basic components that go into a number of electronic products. If Bangladesh could achieve scale economies in these selected components it could become a competitive supplier to countries like China. This would require genuine learning-by-doing but Bangladesh would have a real chance of achieving competitiveness in a few sectors based on its much lower wages. This was a very plausible argument but its realization would require very different policies. It would require the achievement of global competitiveness in manufacturing a range of basic electronics components as opposed to the assembly of finished products like televisions. This would require the setting up of production lines with more significant scale economies and would also involve financing significant periods of loss-making to enable the learning-by-doing that would create genuinely competitive productive sectors. This would clearly be a different strategy than assembly behind tariff barriers. Moreover, while the growth of assembly operations could be helping to develop basic knowledge and capacities in the electronics sector, this would not necessarily help Bangladesh in moving into globally competitive component manufacturing. The production facilities and tacit knowledge required for competitive production in the latter are likely to be quite different.

A similar focus on local assembly of televisions and a pressure to move into the manufacturing of refrigerators was also reported by a third electronics trading company, Transcom Electronics. The company has a long history but its electronics business emerged in the late eighties when it took over the electronics business of Phillips who left Bangladesh in 1989. At that time Phillips used to make light bulbs (using imported glass bulb shells) and assembled its own brand of television using imported knock down kits. Transcom continued to assemble televisions under its own Transtec brand name, but these were knock down kits with no domestic manufactured content. It also imported finished televisions from Samsung. There was a rapid growth in the production of assembled own-brand televisions, from 6000 sets in 2007 to 27,000 planned for 2011. The company also progressed over this period from the assembly of CRT televisions to LCD televisions, using South Korean screens and Chinese motherboards. However, this type of assembly operation was simply based on duty and tax differentials on imported parts as opposed to imported finished goods, with limited domestic value added and learning-by-doing. The effect of these assembly activities on raising know-how and achieving competitiveness was likely to be limited. However, like Butterfly, Transcom also found that the emergence of the local Walton brand of refrigerators negatively impacted its business of importing refrigerators. Transcom too was forced to adopt a strategy to manufacture refrigerators as imported ones were no longer competitive against Walton. Refrigerator manufacturing is clearly different from the assembly of televisions because the refrigerator is almost entirely manufactured rather than being assembled from imported components. In early 2011 Transcom was some way behind Butterfly in terms of setting up plant for producing refrigerators but it was clear to its management that without domestic production it would lose significant market share.

The electronics sector in Bangladesh in 2011 was therefore at a very early stage of development. The only significant breakthrough in manufacturing was in refrigerators where there was substantial domestic value-added. Here, the pioneering role of Walton as a loss-financing investor committed to capability development was critical. Walton’s growing market share based on its investment in domestic production

demonstrates its success in developing significant productive capabilities through learning-by-doing. The subsequent additional assistance that government provided helped Walton to some extent, but the most important effect was to make the imported refrigerator business even less viable for the big trading companies. The major importers were unable to significantly evade the border taxes on finished refrigerators because they were big companies that could not operate entirely outside the formal rules. This resulted in a number of initiatives on the part of these companies to begin their own domestic refrigerator manufacturing and this is likely to create pressures for further quality and price improvements and a search for export markets. All of this is likely to assist the development of this segment of the electronics market.

In contrast, the move into television assembly appears to face more significant challenges. It has been almost entirely an assembly operation based on the incentives for assembly created by differential duties and taxes on the imports of parts compared to the finished products. However, here the gap in the capabilities required for any significant domestic manufacturing of the finished product is so great that there has been no substantial attempt to produce any components domestically. This would require setting up significant production processes and finance the learning-by-doing. The level of protection offered by the border taxes is clearly sufficient for inducing assembly but not for financing the learning-by-doing that would be required for producing any of the components that go into producing a television. Indeed, there are good reasons to believe that the domestic production of all or even most of the components that go into a sophisticated product like a television cannot be a viable strategy for Bangladesh. The most viable pathway into electronics is likely to involve the development of a few specialized components industries that can operate at a sufficiently high scale of production to achieve international competitiveness in those areas. These components could also service a domestic assembly industry for televisions or other goods, but the relatively small domestic market would not make a globally competitive components industry viable.

The development of such a components industry will require dedicated policy support and mechanisms of financing the required learning-by-doing. Given the short time horizons and weak enforcement capabilities of a competitive clientelist polity and weak bureaucratic organizations, this is not likely to be forthcoming without significant pressure from the sector and the development of financing instruments and policy mechanisms whose enforcement requirements can be plausibly met given the political settlement. The experience of industry-led changes in policy suggests that if a case can be built by the electronics industry for a narrowly defined and targeted set of policies to support such an initiative, progress may be made, particularly if investments are led by pioneering companies like Walton. The experience of the electronics industry is positive in the sense that it demonstrates that concerted voice from industry associations can result in some improvements in enforcement, for instance against duty evasion. A similarly coordinated pressure from industry to support a small number of targeted interventions to assist the establishment of a components industry may not be too unrealistic.

5. The Crisis in Power Generation

The power sector crisis reveals a different set of problems associated with features of the political settlement in Bangladesh. Power shortages are a major constraint on economic development, particularly for the growing manufacturing sector. Power shortages are identified by close to 80 per cent of firms as a major constraint on the expansion of their business in different surveys (Asian Tiger Capital Partners 2010). Yet successive governments have failed to make a significant breakthrough in power generation. In 2009, Bangladesh had around 4,162 MW (megawatts) of available generating capacity, compared to around 15,000 MW in Pakistan with a similar population. As Pakistan suffers from serious power shortages of its own, this gives an idea of the severity of the crisis in Bangladesh (World Bank 2010). The industrial sector cannot rely on the power supplied through the national grid and almost every manufacturing unit therefore has to rely on its own captive power generation. Government policy has also been to encourage this by supplying cheap gas to industry, and estimates of captive power generation are close to another 2.500 MW in 2009. But shortages of gas have affected captive power generation too, making the power crisis very serious indeed for industry. Many producers have been forced to back up their gas-based captive power generation with oil and diesel generators, significantly increasing their production costs.

The constraint facing power generation is also a financing problem but one which is somewhat different from the financing of learning-by-doing and the acquisition of tacit knowledge. Power sector investments in fuel extraction (gas or coal in the case of Bangladesh) and in the subsequent electricity generation are long-term investments where costs and returns have to be managed over long periods to be feasible. The problem is that long-term contracts and calculations are difficult when the political settlement has features of competitive clientelism with short time horizons of the ruling coalition and with low and declining governance capabilities of the bureaucratic organizations regulating investment in these sectors. The institutional structure regulating investments in this sector has therefore proved inadequate. A description of the nature of the financing problem suggests that marginal improvements in existing institutions are unlikely to be effective and entirely new ways of financing long-term investments are required, with governance consistent with the features of the political settlement. The investment problems in the extraction of fossil fuels are related to the problems in power generation but our focus is on the latter as the generation problem has to be solved even if Bangladesh has no indigenous fossil fuels and has to rely on imports.

Around 83 per cent of Bangladesh's electricity was generated using domestic natural gas in 2009. Proven reserves of natural gas in Bangladesh are around 13 trillion cubic feet in 2010, which are estimated to cover consumption growing at 6 per cent a year for only about thirteen years. But it is also estimated (with a 90 per cent probability) that undiscovered reserves may increase the total to more than 30 trillion cubic feet (Asian Development Bank 2010: 23-24). For a variety of reasons, gas exploration was slow in the 2000s, partly because of a High Court injunction to stop new production contracts with foreign companies after an explosion in a gas field in 1997. Bangladesh has also been reluctant to allow gas companies to sell gas abroad as there is a public perception that the country needs to keep its limited gas for its own development. This has discouraged foreign investment in gas exploration as multinationals believe that cost recovery will be much faster if they are able to sell the gas rapidly at international

prices. The injunction was lifted in 2006 for exploration in offshore blocks. In 2011 the government signed an agreement with ConocoPhillips of the US to explore gas in the Bay of Bengal with the right to export gas. Perhaps because of the long hiatus in exploration the deal was arguably too advantageous to the multinational. Apparently Bangladesh will have to build pipelines to transport its share of the gas from 150 miles offshore at its own cost, and if it is unable to do so, the multinational can export Bangladesh's gas share too. Not surprisingly, the deal was strongly criticized by the National Committee for the Protection of Oil, Gas and Mineral Resources, Power and Ports, a citizen's group that includes influential academics and professionals.

Imported oil was the second most important fuel for electricity generation, accounting for 8 per cent of generation in 2009. Since 2010, the government has attempted to bypass difficult investments in cost-effective large-scale power plants by commissioning expensive short term 'rental' power projects. The rental plants use imported fuel oil and were awarded contracts of from three to five years duration and for this period at least, the share of oil-generated power would be significantly higher. The contracts were granted soon after the new Awami League government came to power in 2009 without proper tendering ostensibly to speedily address the power shortages facing the country. Short-term rentals are a costly way of generating electricity, with the cost of generation per kWh (kilowatt hour) at least four times higher compared to larger scale generation facilities. In addition, perhaps because of the lack of transparency and competition in the award of the contracts, the prices offered to generators by the purchaser, the Power Development Board (PDB) were particularly unattractive for the taxpayer. The taxpayer was affected because PDB purchases power from generators at a price that is typically a little higher than the price at which it sells to final consumers. As a result, when the PDB purchases electricity at a very high price, its losses go up exponentially and these have to be financed by transfers from the budget. In 2011, the effect of the rental contracts was to increase already significant PDB losses to around one billion dollars per annum, clearly an unsustainable situation (*The Daily Star* December 25 2011).

Coal ranks third, accounting for 5 per cent of electricity generation in 2009. Bangladesh is estimated to have around 2.5 billion tons of coal in five coal fields in Dinajpur and Rangpur that could provide enough fuel for several decades of electricity generation at current levels. However, coal mining has also been held up by debates about the environmental impact of open pit mining which has strong local opposition but is possibly the most effective method of extracting most of the coal. There is also strong domestic opposition to foreign involvement in coal mining. The Awami League government that came to power in 2009 approved a number of coal-fired power plants based on imported coal. The last 4 per cent of electricity generation in 2009 came from renewable sources such as the Karnaphuli dam and some limited biogas and solar generation. These could grow somewhat in the future, but hydroelectric potential is limited within Bangladesh because of the nature of the terrain. At the moment there is no nuclear generation but the Awami League government also signed a framework agreement with the Russian Federation to construct a nuclear power plant at Ruppur. The suggested date for completion is 2017 but this is not likely to be realized given technical challenges and the environmental and other opposition to such a plant.

While problems facing the exploration and extraction of fossil fuels need to be solved, the immediate question is why the generation of power could not be increased with imported fuels. After all, the experience of short-term rentals during 2010-11 shows that the government was willing to subsidize the generation of power, indeed to an unrealistic extent. Yet it failed to deploy subsidies to facilitate the installation of cost-effective and sustainable power plants. The institutional failures here are related to the ways in which the political settlement (Khan 2010, 2011) affects the operation of institutions relevant for enabling investments in the power generation sector. An examination of these determinants suggests that the constraining factors are unlikely to be significantly affected in the short to medium term using traditional policy tools of improving 'good governance'. This includes, as we shall see, attempts to improve procedures so that the awarding of contracts is made more transparent. However, an examination of the political economy creating constraints in this sector suggests that a way to break the cycle of constraints would be for government and development partners to create a substantial long-term investment fund that can lower the cost of long-term finance for the power sector. For this to be effective, there would also have to be effective governance reforms to create capacity in the bureaucratic agencies charged with managing the conditions for accessing these funds. Bureaucratic capacity building is not easy in a competitive clientelist polity, but if the goals of capacity building are restricted to one or two critical agencies there is a better chance of success. Few sectors can be more critical than power and the focus of capacity building on these agencies can be justified as vital for sustaining development.

Significant Characteristics of the Power Generation Sector

The power generation sector in Bangladesh in the late 2000s and early 2010s appeared to be trapped in a vicious cycle. The interlinked characteristics of the problem can only be understood if we simultaneously look at features of the political settlement and features of specific economic policies that affected the evolution of the power sector for some years. The political settlement had evolved into a competitive clientelist one, with a gradually increasing fragmentation of the political organizations out of which the ruling coalition was constructed through political competition. The relevant economic history of the power sector refers to the factors that resulted in a relatively low share of the public sector in power generation in Bangladesh. Government policies for some time had been aimed at increasing private sector participation in generation. However, private sector investors in power generation faced growing risks which could not be adequately addressed. The main risk was the credibility of the long-term contracts made by the sole purchaser of electricity, the Power Development Board or PDB. The latter contracted to buy electricity at prices fixed by the contract that was granted to producers through a process of competitive bidding. But the prices at which the PDB could sell electricity on to final consumers were constrained partly by the political imperative of keeping power prices low. In addition, if the supply of power had positive externalities by accelerating the growth of employment in the productive sector, small subsidies to power could be justified in terms of a standard economic logic.

The problem was that the growing deficit of the PDB created a very specific 'risk premium' for new investors in terms of the credibility of the long-term contracts they were signing. In this context, the political settlement with its implications for the enforceability of formal contracts ensured that the only likely investors in long-term projects would be firms that had close political connections with political

organizations. Political connections could help to ensure either that contract enforcement would continue for long enough for the investment to become viable or in a more adverse scenario it would allow enough up-front profits to be made so that the financial viability of the investment would not depend on the enforcement of contracts in the distant future. However, these types of calculations result in a further worsening of the risk premium for subsequent investors, because the adverse selection of politically connected organizations has consequences for the pricing that PDB contracts and therefore the future viability of subsequent contracts. This logic can set off a vicious cycle of escalating risk perceptions and costs of financing investments in long-term projects. We begin by looking at some of the evidence, then present an analytical argument that links these characteristics in a causal framework that is located within a specific political settlement, and finally discuss the institutional escape routes given the likely persistence of the political settlement.

i) The share of the private sector in electricity generation is already high and set to significantly increase. In Bangladesh the private sector generated 38 per cent of electricity in 2010 compared to less than 15 per cent in India. Moreover, the strategy of recent governments has been to base expansion almost entirely on the private sector. The Awami League government of 2009 in its 'New Initiative' planned to attract an additional US$ 9 billion of investment in power generation by 2015, of which US$ 8 billion was expected from the private sector. If this had been achieved, then ignoring other private sector projects such as rental projects, the proposed additional capacity would raise the share of the private sector to around 65% of generation capacity (based on figures in Government of Bangladesh 2010). The reasons for the focus on the private sector can be traced back to weak bureaucratic capabilities in Bangladesh, and the significant weakening of these capabilities as a result of the disruptions and politicization of the bureaucracy that happened in the years after 1971. The attempt to nationalize almost everything between 1972 and 1975 had the perverse effect of weakening the civil service by involving it in politics and primitive accumulation. The post-1975 political settlement moved towards a much greater reliance on the private sector and capabilities in the public sector were further neglected. However, in a poor country with weak contract enforcement, the expectation that the private sector will invest in long-term projects where revenue is derived from government contracts to buy electricity over a period of many years or decades faces serious enforcement and incentive problems.

The political economy of investments in power generation in Bangladesh can be compared to that in the Indian power generation sector. India has achieved significantly greater power generation relative to Bangladesh, even though Indian power generation also faces significant challenges ahead. In 2007 India's per capita consumption of electricity was 714 KWh compared to 155 KWh in Bangladesh (World Development Indicators 2010). In contrast to Bangladesh, the public sector has played a much more significant role in India's power generation. Till 1990, electricity generation was almost entirely reserved for the public sector. Even after liberalization and the recognition of private sector participation in the Electricity Act 2003, the private sector generated less than 15 per cent of Indian electricity in 2010. In addition, the expansion plans of Indian policy-makers realistically foresee a relatively limited role for the private sector. For instance, the 11th Plan (2007-2011) envisaged a total additional investment of US$ 87.5 billion in power generation of which only US$ 18 billion or around 20 per cent was expected from the private sector

(Altaf 2009: Table 2.1). These figures do not necessarily reflect a bias against the private sector because the Indian government has been trying hard since 2003 to attract private participation in infrastructure. Rather, they reflect the difficulty of attracting private investment in generation even in India. Of the several hundred MOUs that were signed for IPPs since 2003, only about twenty actually came on stream by 2010. An important reason for most withdrawals was the lack of sufficiently credible payment guarantees.

ii) The risk premium for private sector financing for power generation is high and growing and affects the long-term feasibility of private investment. Private investors in power generation and ultimately their financiers have to absorb the risks that affect long term investment in a poor country. These include political risk that future governments will not honour contracts made by previous governments who may also be their mortal enemies in a competitive clientelist context. The difficulty of contracting against all future contingencies and the risk that even contracted contingencies may be difficult to enforce combine to raise the risk premium, and this is reflected in the cost of financing large long-term infrastructure projects using market financing. In addition, there is the specific problem of the viability of the PDB as the purchaser of power when it is well known that the subsidies that the PDB requires must grow in line with the growth of the power sector and with any increase in the purchase price of power that is greater than the selling price. The typical PDB contract to purchase power is based on current fuel costs, and the price has a 'pass through' clause that adjusts the purchase price if the fuel price increases. This protects the particular generator but by making PDB more vulnerable, increases the risk for the power sector collectively unless the PDB can be expected to pass on all fuel cost increases to consumers. This is unlikely in a poor country. For instance, in 2010 the World Bank estimated that the projected transfers to PDB were likely to grow from around 8 billion taka in 2008-09 (around US$ 115 million) to around 29 billion taka in 2011-12 (around US$ 415 million) as a result of the rental power project contracts coming on stream (World Bank 2010: 21). In fact as referred to earlier the actual annual subsidy was reported to have grown to around US$ 1 billion by 2012. This was a result of an escalation in fuel costs faster than retail tariffs and perhaps also because some of these rental contracts were even less favourable than the World Bank had initially estimated. Clearly, subsequent private sector investors contracting with the PDB would take its worsening financial viability into account when signing long-term contracts. More than that, banks and financial institutions providing loans to these investors would add a risk premium to the price of their lending that would depend on their own perception of the future viability of the PDB and its finances.

The post-2008 financial crisis in the West has further raised the risk aversion of international banks and therefore the cost of finance for developing countries like Bangladesh. The relatively limited financing available from local banks, the higher costs of organizing international financing packages and the relatively limited cover currently available from international financial institutions like the World Bank makes it implausible that the ambitious expansion of private sector led investments in the power sector envisaged by the Bangladesh government can materialize. In particular, the cost of financing power sector investments will increase, partly as a result of worsening international financial conditions but primarily because of the higher risk premiums that financiers will add to successive power projects where the buyer is the PDB. The cost of financing is a significant determinant of the cost of generation. For

instance, for a relatively small 400 MW plant requiring an investment of US$ 340 million, AT Capital calculate the impact on the cost of generation of a small change in the cost of financing. In their example, the investor covers 30 per cent of the financing cost with equity and 70 per cent from loans. In one scenario, the investor has to raise this in the higher cost domestic market, and in the other they can borrow in international markets at a lower interest cost. Power sector investors in Bangladesh do have access to low interest loans from a domestic financial institution financing long-term projects, the Investment Promotion and Financing Facility (IPFF). This can lend at around 6 per cent but their lending is restricted to 8 per cent of the total project cost. The other 62 per cent in this example therefore has to come from domestic banks which would charge at least 12.5 per cent in 2010. In contrast, foreign financing of the entire 70 per cent may have been available at around 7 per cent. The interest rates in their example are not necessarily realistic because they ignore risk premiums. What is significant is that an extra 5.5 per cent interest charge on just 62 per cent of capital results in an additional 16.4 per cent in the cost of generating a kilowatt-hour of electricity (Asian Tiger Capital Partners 2010: 24-5). These figures illustrate that a relatively modest increase in interest costs can have a relatively big impact on the percentage increase in the cost of power. This in turn stretches PDB finances and can raise the risk premium and therefore cost of financing for the next power project.

In contrast, India's greater success in generating electricity is closely associated with the availability of relatively low cost public financing, initially for public sector generators but increasingly also for the growing number of private sector generators. This financing has come from fiscal resources going directly to finance investments by public sector power generators and also through a number of financial institutions, in particular the Power Finance Corporation (PFC), set up in 1986. The PFC is particularly interesting as it was set up as a special purpose development bank for power utilities given the perceived chronic underfunding in the Indian power sector. The Indian government initially capitalized it with equity and tax free bonds. The timing of its creation was serendipitous. Within a few years the Indian capital markets had matured enough to develop an appetite for infrastructure bonds. In 1997 the PFC underwent securitization and emerged with its balance sheet healthier. In 2007 the government of India divested close to ten per cent of its holdings in the company in one of the most successful initial public offerings by a public sector enterprise.

Even though the corporation now provides funds to both public and private sector companies its disbursals remain skewed towards the public sector given the dominance of the public sector in Indian power generation. The PFC is the main provider of funds for investments in generation and does this through term and bridge loans, supplier's credit, debt refinancing and lease financing among other methods. It provides the public sector with up to 80 per cent loan coverage for generation projects and up to 50 per cent for private sector projects. The corporation itself raises money through bonds which enjoy the highest credit ratings in India and according to Moody's its international rating was identical to India's sovereign rating. The ability of the PFC to access public finances and borrow at credit ratings available for Indian sovereign debt significantly reduces the cost of capital in the Indian power generation sector. For instance, in 2010 India's prime lending rate was 12.25% and most PFC loans were actually cheaper: between 10.75% for highly rated states and AAA rated companies to 12.25% for some non-rated private sector borrowers.

iii) A very small number of players with close relationships with government remain at the final stages of bidding for significant power generation projects. A recent example is the bidding for major new projects under the Awami League government that took power in 2009. The three major projects were the Bibiyana 1 and Bibiyana 2 plants and the Meghnaghat 2 plant. Each of these plants had a capacity of between 300 and 450 MW, primarily using gas, and located near known gas fields. Meghnaghat 2 was to have the capability of using fuel oil as well. All three contracts were granted to Summit Group, a power sector company whose CEO was the brother of the Commerce Minister of the day. Summit was also one of the companies that benefited from favourable rental power project contracts. The prices bid by Summit for power generation in the three major contracts were not high so there were obvious questions about how realistic its bid was and how it intended to finance its investment in these projects. Interviews with Summit financial officers revealed that it did have a financial plan but it was based on achieving indirect access to favourable public financing. The company had till February 2012 to finalize its financial package but by end 2011 this had still not been completed. At best one or two of the three projects may eventually be financed, but even that might be an optimistic assessment.

iv) There appears to be significant leakage at the procurement stage in power sector projects. This is in contrast to countries like India where significant leakages are more likely to happen at the distribution stage. Procurement problems have resulted in persistent problems with the World Bank and other international financial institutions about procedures and transparency. To enable rent capture at the procurement stage, technical specifications are often tailored to ensure that bidders preferred by particular insiders are favoured (by tailoring the specifications to the machines supplied by that bidder), or specifications are deliberately set to be very demanding to ensure that outsider bidders (who have to comply fully with specifications) can only bid relatively high prices for their electricity while insiders can bid lower generation prices because they can expect lax monitoring of the specifications when it comes to implementation (World Bank 2010: 17-19, 22-30).

All clientelist political settlements can be expected to be associated with weaknesses in the enforcement of rules and therefore with some leakage of public resources. But the mechanisms through which leakages happen are important and can be different across countries and political settlements. For instance, unlike Bangladesh, power generation projects in India do not appear to result in serious losses at the procurement stage. The major leakage of rents in the Indian power sector takes place at the transmission and distribution (T&D) stage through the State Electricity Boards (SEBs) in each state. Unaccounted-for electricity (mainly due to theft or non-payment, but also some technical losses) amounts to an astounding 30 per cent, equivalent to almost US$ 9.6 billion in 2010 according to the Government of India's own figures. These losses are projected to grow further to almost US$ 14.5 billion by 2011. The likelihood of a possible future default in payments to power generators is therefore similar to Bangladesh and may have resulted in a similar vicious cycle of high risk premiums, high generation costs and shrinking time horizons for rent seekers if growth in generation capacity had been driven largely by the private sector raising capital in private financial markets.

v) The award of contracts in power generation projects is subject to prolonged decision-making delays and is often blocked at the final stages. The absence of

significant private sector investments since 2002 is remarkable and distinguishes Bangladesh from most other developing countries. This is despite several attempts at repeating the experience of the two early (and very successful) independent power producer projects (IPPs). In subsequent cases, insiders were divided about the award of the contract in question, which was typically blocked at a late stage. Examples include the decision not to award the Sirajganj 450MW IPP in 2004. This was ostensibly on the grounds that the sponsor (Summit) did not have adequate experience even though the World Bank made the case that the tariff offered by the sponsor was competitive and the procurement procedures were tolerable. The first round of Bibiyana I also ended in a stalemate because of unrealistic bidding and construction timetables that deterred outside bidders, while the local bidder (again Summit) was disqualified this time for not meeting the net worth qualification requirement. The sole remaining bidder was Malaysian Powertek, but their bid price was rejected by the emergency caretaker government that took power in 2007. Multiple decision-making points, weak technical assessment capacities within government, the existence of different factions within government supporting different sponsors, and risk aversion on the part of some bureaucrats fearing future charges of corruption are amongst the reasons cited. The Awami League government that took power in 2009 did award a number of contracts but the most important ones were to Summit, a company very close to the government.

vi) There have been remarkably few major successes in the completion of independent power producer projects so far. In fact, there have been no significant successful private investments in generation since the Haripur and Meghnaghat 1 investments that became operational in 2001 and 2002 respectively. In both these cases, the cost of capital was reduced as a result of World Bank involvement, directly in the case of Meghnaghat 1 through the financing provided by the Infrastructure Development Company Ltd. (IDCOL) which in turn received World Bank financing. In the case of Haripur the World Bank contributed to reducing the cost of capital indirectly by providing a Partial Risk Guarantee. Procurement processes were also effective in both cases and achieved two of the lowest costs per KWh in the IPP sector and even relative to average public sector generation costs (World Bank 2010: 16).

It is very significant that favourable institutional finance played a critical role in successful private sector power generation projects in the past. IDCOL's US$ 80 million dollar contribution to Meghnaghat 1 was the largest loan ever made by a Bangladeshi financial institution and it made a significant contribution to the cost of capital in that project. The government has contributed US$ 350 million in local currency to IDCOL in 2009-10 and the ADB committed another US$ 165 million (Asian Tiger Capital Partners 2010: 12). However, IDCOL does not currently focus on power generation and its priorities have shifted elsewhere. The biggest potential financing source for power sector investments in the early 2010s was the Investment Promotion and Financing Facility (IPFF), a World Bank supported fund that has disbursed US$ 47.5m in low interest loans since 2006. A number of small power plants have benefited from this financing facility (Asian Tiger Capital Partners 2010: 12). The importance of low cost institutional financing for infrastructure projects is well understood but compared to the billions of dollars required to make a significant impact on the scale of power required in Bangladesh, the dominant public sector financial institutions like the IPFF have at most a capital base in the low hundreds of

millions of dollars, and only a small part of that is potentially available for power sector investments.

Analytical Framework

The six characteristics of Bangladesh's power generation sector described above are closely connected in terms of mutual causation. The most important directions of causality, drawing on our understanding of the contemporary political settlement in Bangladesh, are summarized in Figure 7. The multiple lines of causality show that many critical features are both cause and effect in an interdependent causal framework. Understanding the lines of causation is important for designing effective responses to the constraints that collectively both cause and describe the challenges facing the electricity generation sector.

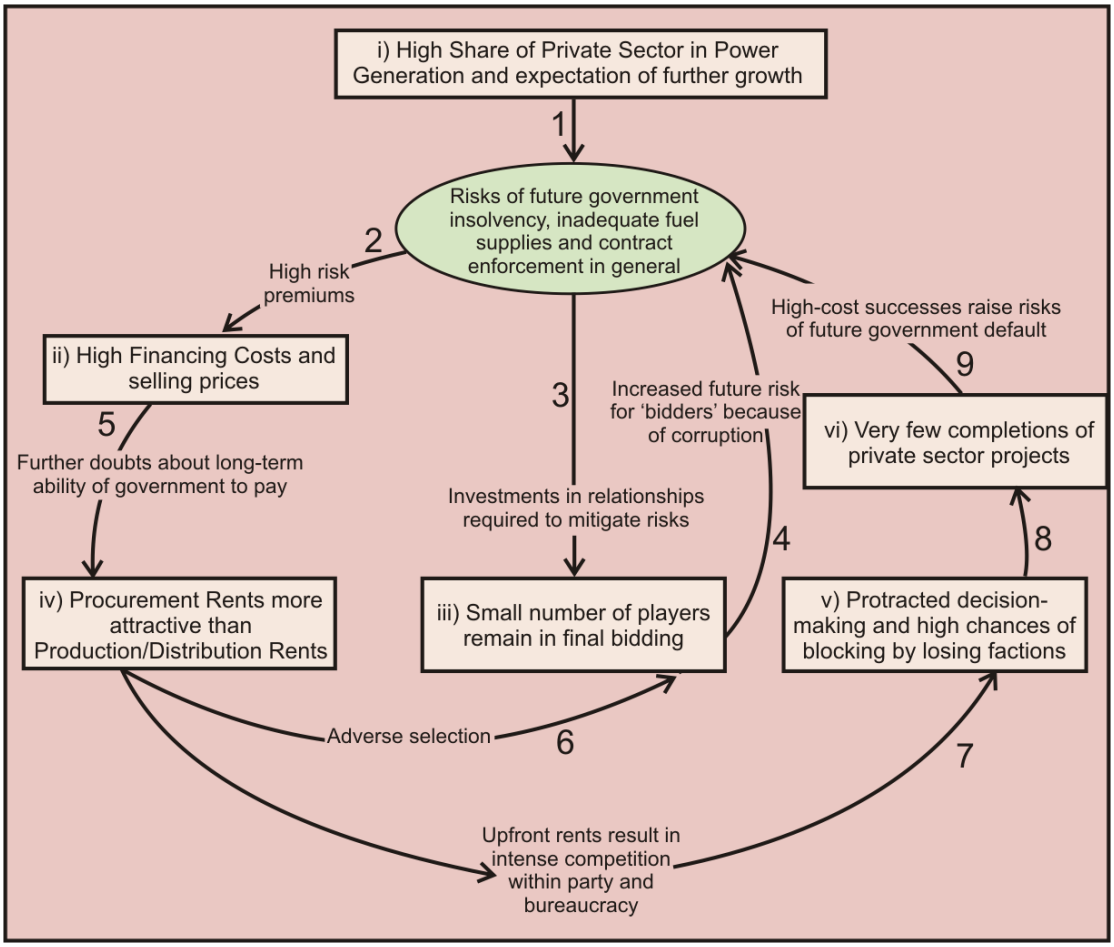

Figure 7 Causal links between critical characteristics in power generation

Our starting point is characteristic (i) in Figure 7 that describes the dominance of the private sector in electricity generation in Bangladesh and the strategy of increasing power generation by relying almost entirely on the private sector. This in turn reflects the fact that the public sector and public funds are no longer perceived to be sufficient for financing the expansion of power generation in Bangladesh. The share of IPPs in power generation is therefore projected to grow rapidly in Bangladesh, if the plans of governments can actually be implemented. Nevertheless, a comparison with India suggests that policy-makers may be expecting the mix between public and private to shift too rapidly in the direction of the private sector in Bangladesh given the

unwillingness of private sector investors to invest in a sector with high risk characteristics. Indeed a rapid initial growth of private investment may have severe implications for the risk premium facing new investors in power sector projects.

Arrow 1 describes the general problem with IPP investment in developing countries. Private sector investments in power are not in general constrained by classic 'public good' problems of non-excludability and non-rivalry as power is not a pure public good. Nevertheless, market failures are significant because of potential problems with contract enforcement due to political risks and unforeseen future contingencies. These are important in a sector with significant structural risks due to inevitable uncertainties surrounding future fossil fuel supply and fuel pricing over long periods. To reduce the risks facing private sector investors, PPP contracts specify a number of contingencies that are covered by the government. In particular, they typically guarantee payments for a minimum quantity that will always be purchased and at a 'pass-through price' (which means the government absorbs all risks of fossil fuel price inflation), often with Partial Risk Guarantees from the World Bank. However, even contingencies that are covered by contract may be difficult to enforce in the distant future if the financial condition of the government becomes significantly adverse. Moreover, given the weakness of contract enforcement by courts, the risk faced by different investors may not be the same in a potential crisis. Entrepreneurs with better political connections can expect to be 'last out' in a potential crisis.

Power plants may have a life in excess of twenty years and many years of operation may be required to recover significant capital costs. Investors therefore need to be satisfied about revenue income over many years in the future before they can feel confident about taking these risks. This risk can grow rapidly if a significant expansion of IPPs is being contemplated and sales of power to final consumers are significantly subsidized. Both happened to be the case in Bangladesh in the early 2010s. The solvency of future governments may therefore become significantly worse directly in proportion to its success in implementing IPP projects! (This is described later in Arrow 9). Given that the financial conditions of governments and economies many years in the future are difficult to predict, power sector contracts are fundamentally incomplete. The risk is not necessarily one of expropriation but of potentially disruptive future transaction costs in renegotiating contracts in different local and global circumstances. These features of the sector mean that the construction of power plants faces uncertainties that cannot be easily addressed through full contracting and this in turn has two important effects.

Arrow 2 shows the most obvious implication of these non-contracted risks: the risk premium results in higher private sector financing costs for power sector projects. This explains our observation of characteristic (ii) in Figure 7 that private sector financing for power projects is expensive and likely to have an impact on the final price of power. The cost of finance is therefore both a dependent variable and a variable whose magnitude determines other characteristics of the market that in turn affect the risk premium. This circularity opens up the risk premium to the possibility of vicious or virtuous cycles of causality that we will discuss later. Regardless of what a PPP contract guarantees, the market is likely to factor in a growing risk premium if the systemic capability of the government to deliver on contractual commitments to the sector is perceived to have deteriorated. For instance, the unsolicited and very high cost rental contracts that the government entered into in 2010 are very likely to

have already had this effect on market sentiment regarding the government's commitment to protect the future solvency of the PDB. As a result, we should expect the risk premium built into the average cost of commercial financing for the next IPP to have already become a little higher than in the past.

High financing costs in turn have a number of important effects for investments in this sector. Indeed, the self-fulfilling characteristic of high risk premiums that follow from our causal analysis partly explain why the public sector or at least public financing and/or financing by international financing institutions (IFIs) have historically played an important role in the power sector in developing countries. Both the public sector and state-assisted financing for the private sector continue to play this role in India despite the significant opening up that has happened in that country. The market failures that prevent full contracting mean that a significant role for public financing of power sector projects may be more efficient even though power is not a pure public good. In particular, in very poor countries, private risk perceptions may suggest a price for power generation that may be beyond the purchasing capacity of emerging industry and retail customers, requiring unsustainable levels of government subsidy if the cost of capital cannot be reduced *ex ante*.

Arrow 3 shows the other important and simultaneous effect of the high risks associated with IPP investments. The private investor knows that whatever the contract says, in potentially adverse future conditions the contract may be difficult to enforce and there are many unknown and therefore non-contracted risks that can also affect the overall viability of the investment. As a result, it is rational for firms to invest in 'relationships' with government and with political organizations more generally, to mitigate these risks by keeping open preferential and personalized channels of negotiation that allow ongoing informal contracting and enforcement. In case of future difficulties with payments or access to fuel, investors know that contacts and informal bargaining are more likely to be important than contracts and formal processes of redress. Given the high cost or even implausibility of enforcement through the formal legal system, firms are more likely to be able to negotiate required changes on an ongoing basis, or to ensure that they will be higher up the chain of claims in case of financial difficulties if they can call on long-term relationships with politicians and bureaucrats in critical positions. This is not a sufficient guarantee because politicians and bureaucrats will certainly not remain in place for the lifetime of a power project, but it is unlikely that firms will even begin to engage in this sector in the absence of these relationships.

This explains characteristic (iii) in Figure 7 that only a small number of bidders remain at advanced stages of bidding in this sector. As complex negotiations cannot rely entirely on legal procedures given the weak legal framework in developing countries, only firms that have strong relationships with insiders are likely to sustain progress in these negotiations. As these privileged relationships are based on historical accidents and relationships already developed through existing businesses, it is likely that only a relatively small number of firms have the requisite investments in informal networks to enter these negotiations. This also explains why firms as diverse as furniture and cement manufacturers in Bangladesh have demonstrated a comparative advantage in entering the bidding process for investments in the power sector. Their comparative advantage is not based on their technical expertise in the

power sector, but rather their extensive informal contacts with government and the bureaucracy.

Arrow 4 shows that the close links between political and economic organizations also enable collusion and corruption that further increases the risk for investors because contracts are likely to be re-examined by subsequent governments if new relationships are not rapidly established. Thus, while there are structural reasons privileging firms and individuals with established relationships with government and bureaucracy, these conditions also enable collusion between insiders. For instance, as discussed earlier, technical specifications can be set to privilege suppliers associated with particular local sponsors. The interesting observation is that even if firms and governments did not initially want to engage in corruption or collusion, the high level of contingent risks that cannot be contracted for can create strong pressures for long-term personalized relationships between business and government. These relationships provide some confidence to investors that contingencies will be reasonably addressed if and when they arise. But once these relationships exist, it is very difficult to prevent a slide into additional privilege-seeking collusion.

Ironically, even if a firm resists capturing additional advantage using its relationships, it is very difficult to signal this to the general public or to subsequent governments given the structural factors that ensure the uncompetitive nature of the market and the clear presence of strong personalized relationships. The presumption will be that insiders have benefited and new governments are likely to demand payoffs to establish new relationships that will need to be developed to sustain the projects. Firms therefore have every incentive to keep some rents on reserve to meet these requirements. This argument is not intended to excuse the ongoing corruption and collusion of participants, but to demonstrate that this type of corruption is unlikely to be addressed using standard anti-corruption tools such as greater transparency in the award of contracts. Personalized relationships here are not the result of limited transparency. Rather limited transparency is a result of relationships that are required to sustain investments in a context where risks cannot be contractually mitigated.

Firms know that the relationship between government and opposition is likely to be acrimonious in the context of a ‘competitive clientelist’ political settlement (Khan 2010). In this context, the ruling coalition is severely constrained in its ability to offer credible formal assurances to potential investors that they will not be expropriated by future governments. If the relationships between the ruling party and investors are *perceived* to have resulted in ‘rent sharing’ with the ruling party, the process through which the contracts were offered may be questioned by an incoming party after an electoral victory as a way of punishing particular investors who were close to the outgoing party. In Bangladesh there is a history of companies winning major government contracts being targeted on technical legal grounds by a new ruling coalition if they are perceived to have had significant economic relationships with the previous regime. These attacks are in most cases of temporary significance because there are political processes through which such companies and individuals can eventually protect themselves. For instance, it is common for companies to establish relationships with the new ruling party. Arrow 4 simply shows that this requires resources and involves additional uncertainty.

Returning to the high financing costs, characteristic (ii), this has a number of additional and very important effects that are relevant for understanding challenges in the power sector. Arrow 5 shows that high financing costs can in turn contribute to a preference for procurement rents as opposed to rents in production or distribution. The distinction refers to whether significant rents are captured by business and government at the procurement stage by colluding in the price and quality of the *capital equipment* that is delivered or in the production and distribution of *electricity* by colluding in the pricing of power and fuel or indeed the calculation and collection of bills. The former creates significant upfront rents at the very inception of the project, while the latter can create a stream of somewhat more modest rents through the lifetime of the project. The latter may add up to be significantly higher in aggregate, but if parties are unsure about the economic viability of the project over time, or have very short time horizons, they may prefer procurement rents over production and distribution rents. Thus, high financing costs that raise the cost of power generation and create doubts about the long run viability of the underlying contracts can increase a preference for procurement rents. This is because the higher the cost of generation, the greater the subsidy required to PDB to sell on this power and therefore the greater the doubts about future viability and future streams of rents. A preference for one or other type of rent is not neutral in terms of the likely effects on power generation. An interest in procurement rents may result in very inferior investments that further increase the actual cost of production and put pressure on the future viability of the contract. An interest in production and distribution rents may have a high social cost later but may be consistent with immediate strategies to increase the generation of power.

Arrow 5 suggests a plausible but adverse rational response of private investors in this context of uncertainty about the future solvency of PDB and ultimately of the government of Bangladesh. Regardless of payment guarantees in PPP contracts, it is implausible that the government will continue to pay if it is financially unable to do so. The greater the number of IPPs that already exist ahead of a particular investor, the less confident that investor is likely to be about the remedies available in case of a systemic insolvency of PDB at a future date. The rational investor, particularly the local sponsor who may be more aware of local political economy, is therefore likely to want to make as much of their return as possible upfront and rely less on the stream of future incomes for guaranteeing an overall return on investment. This could explain characteristic (iv) in Figure 7, the strong preference for maximizing ‘procurement rents’ as opposed to collecting rents on production and distribution.

It is not rational for government and investors to focus on capturing production rents by colluding to set the price of generated power except perhaps in the case of very short term projects like rental projects. For longer term projects, where more significant capital costs have to be incurred, collusion in setting a somewhat higher price for power purchases is less attractive because sustaining these future payments may not be credible. It is more rational to collude in overpricing procurements of capital equipment. In extreme cases, the lack of confidence in the future can be so severe that future projects and the future of the current project lose any attractiveness for public officials and investors and both become mainly interested in procurement profits in the immediate project under consideration. In this extreme case the project under consideration resembles a one-shot prisoner’s dilemma where neither government nor investors have any incentive to rein in their immediate incentives to

capture rents through procurements. Once again, our aim is not to say that conventional explanations of procurement irregularities focusing on greed and the absence of transparency are wrong. However, there are overlapping structural factors that create strong preferences for this form of rent capture as opposed to others, and this has further implications for the viability of investments in power generation.

The preference for procurement rents in turn has two other effects. Arrow 6 suggests that in this context there is likely to be an adverse selection of bidders. Those who are unwilling to play by these rules will be weeded out because the structure of incentives will not attract them nor are they likely to find champions amongst government insiders. This in turn reinforces the observation of a small number of serious players in the bidding game, characteristic (iii). In addition, the tendency of these bidders to prefer procurement rents means that some or all of their projects are likely to suffer from high cost and low efficiency. This in turn implies higher risks for all investors in the future (Arrow 4) and eventually (through Arrow 2) to even higher risk premiums for the sector. This is one example of the cumulative causation that can lead high risk premiums to be self-fulfilling in the sense that the effect of a high risk premium is to drive risk premiums even higher next time.

Arrow 7 suggests another equally serious consequence of high financing costs and the preference for procurement rents. Procurement rents can offer significant upfront prizes for the individuals and factions in government and the bureaucracy who are championing particular sponsors. While greed and limited accountability does drive some corruption in developing countries, we know that political leaders also have a structural requirement for rents to sustain the political system (Khan 2006; North, et al. 2009; Khan 2010). However, the types of rents that are available do matter in determining the strategies of different actors and the economic outcomes of their rent capture strategies. A focus on procurement rents has particularly adverse implications not only for the quality of projects, but also for the intensity of conflicts within the ruling party and the bureaucracy. Different factions within government typically champion rival bids and have strong relationships with competing suppliers. If the primary source of rents comes at the procurement stage, the likely result is that there will be more intense conflicts between factions and groups within the ruling party and the bureaucracy than if the rents came from production and distribution over longer periods of time. Large sums that can be made over short periods of time greatly increase the stakes in intra-party and intra-bureaucracy factional conflicts, particularly if the overall financial vulnerability of the power sector makes it unlikely that there will be a significant stream of projects over time. The one-shot nature of the rent capture game can result not only in prisoner's dilemma incentives for investors and government, but also in intense conflicts within government because the likely winners from the current procurements round may well be the last ones for a while. This can help to explain a critical characteristic of the Bangladeshi power sector: protracted decision-making procedures and high chances that projects will be blocked by disaffected factions at the last moment, characteristic (v) in Figure 7.

Protracted decision-making and delays in the power sector are typically explained by the lack of technical capabilities within the power bureaucracy in Bangladesh and by multiple decision-making points within the government. But it is possible to interpret these structures in another way. If significant up-front rents are available through power sector investments, these rents acquire a great deal of importance within the

ruling coalition. The importance of power sector rents and the strategic importance of the sector are underlined by the fact that the power portfolio comes directly under the Prime Minister in the 2009 Awami League government and major investments have required prime ministerial clearance in all governments. Yet multiple points of decision-making are also retained. For instance, the post-2009 Prime Minister works not only with a state minister but also with a power advisor. We know informally that there are other powerful individuals both in the party and the bureaucracy who have an input into the decision-making process under the umpiring role played by the Prime Minister. This structure is perhaps not accidental and suggests the sensitivity of managing factional conflicts over significant rents within the ruling party. The aim appears to be to enable factions to compete for these rents because attempting to override powerful factions entirely may be very costly for the ruling party. Unfortunately, the nature of the rents available makes this competition dysfunctional (low quality investments are the likely outcome) as well as intense.

The intensity of these intra-party conflicts can be better understood by remembering that in a 'competitive clientelist polity', the ruling parties are themselves coalitions of factions. Individual investors have relationships with particular politicians and factions within the ruling party. If the incentive structure is such that bidders are likely to make significant 'procurement rents' at the early stages of the project, there is likely to be a scramble between factions within the ruling party to be associated with lucrative investments from which the faction can benefit. This increases the stakes and therefore the intensity of the conflict over the award of particular projects. If the rents had accrued over time, the immediate stakes would have been lower and the benefits would have accrued to a more diffuse group within political organizations over time. There would be no incentive to destroy rent streams created by the previous ruling coalition and strong incentives to add to that rent stream by approving new projects. Indeed the type of rents available could create incentives for 'live and let live' compromises emerging between rival clientelist coalitions to enable them to share some rents whose flows continue over time. Something like this is seen in India in power sector projects where competing clientelist parties implicitly cooperate in capturing rents in sequence without blocking or destroying the work of others. In contrast, if the power sector rents come in the form of a small number of lucrative projects that are not likely to be repeated very often, it becomes rational to contest intensely. Intra-party competition can appear to take the form of government indecision about projects and procrastination in the granting of contracts. In extreme cases no decisions are made.

Arrow 8 shows that occasionally IPP projects can go through but the success rate is relatively small, characteristic (vi) in Figure 7. Finally, Arrow 9 describes the paradox that after a few successes, subsequent projects may become *less* viable if the gap between the buying and selling prices in the projects already signed imply a significant growth in transfers to PDB from the budget. The more financially strained the PDB and the Government of Bangladesh become, the higher the risk premium in Arrow 2, and the more binding the succeeding constraints become. This insight allows us to explain why the early IPPs at Haripur and Meghnaghat 1, went through so much more easily compared to subsequent attempts at closing deals. It is possible that Bibiyana 1 and perhaps one or two more projects currently under discussion may eventually go through. Bibiyana 1 in particular has relatively low risks as a project given that supplies of gas are technically assured. But without a strategy for cracking

the interdependent links identified in Figure 7, it is unlikely that Bangladesh will achieve the scale of power sector investments that the country requires.

In the context of this analysis it is worth asking how the major Bangladeshi player in the power sector, Summit Power Ltd., managed to bid relatively low prices for the three major projected plants, Bibiyana 1, Bibiyana 2 and Meghnaghat 2. The answer is that Summit had not finalized its financing arrangements when it made its bid, and its pricing was based on fairly optimistic projections of the financing costs. A few months before its deadline of February 2012 when it was supposed to make its financing arrangements known to the government, the company had still not announced that the financing issue had been resolved. Interviews with a Summit director and a technical advisor in 2011 suggested that Summit took an optimistic gamble in expecting to raise finance in a number of innovative ways.

The total investment for the three projects was estimated to be around US$ 850 million. Its main machinery supplier, General Electric of the USA would give it suppliers' credit for two years. GE would also have a small equity stake in the company of around 6 per cent of its capital. The rest of the equity stake including the holding of Summit would provide a total of 30 per cent of the capital. A further 20 per cent was projected to come from international financial institutions like the IFC, the ADB, the Islamic Development Bank, and bilateral development agencies interested in acquiring an equity stake. But a full 50 per cent of the investment was to be financed by floating convertible bonds in the local market. The bonds would have an initial coupon return of 5 per cent, significantly reducing the financing cost for Summit. The attractiveness of these bonds for buyers would come from the fact that after the fourth year, they could be converted into stocks. With optimistic projections of the stock price, this would give the convertible bond holders an expected return of around 17.5 per cent per annum over eleven years. Part of the bonds was also to be repaid after 8 years. The complex formula was a win-win offer but the details hung on the expectation that the local Bangladeshi capital market was ready for such a significant transaction. Part of the reason behind Summit's confidence was that its privileged position had allowed it to get a commitment from public sector banks to take up almost a quarter of the bonds, and BIFF was also expected to buy around 10 per cent of the bonds. Of course, till it happens, commitments from public sector banks are simply expressions of interest in a company known to be close to the government.

Effectively, the initial Summit financing plan was to achieve a significant level of indirect public financing, without going through the route of an explicit public financing instrument and a governance agency that will monitor the use of these public funds in any explicit way, or that can ensure that the projected return is delivered. Indeed, because of this the financing proposal may be blocked at any stage by factions within the ruling coalition or bureaucratic organizations who do not want to be associated with such an arrangement or who would oppose it because they felt they had been left out of a fair share of the benefits. The plan is also very likely to be affected by valuations of future stock in an environment where the Dhaka Stock Exchange was rocked by insider trading and dramatic price falls in late 2010 and all through 2011. Summit is widely rumoured to have been one of the players in the stock market benefiting from poor regulation. It is unlikely in this context that a very significant bond issue will be successful without significant uptake by public sector

banks at the very outset, and that too may attract strong opposition from many quarters. Thus, while the Summit financing plan is audacious and well thought through, and would indeed have lowered its financing costs if it could have been implemented, it is unlikely that the company will be able to raise the full US$ 850 million through this route. It is very likely that Summit will have to find alternative sources of financing at a higher financing cost and this may affect the quality of the investments it may wish to make in the ways discussed above.

Evaluation of Policy Responses

The most common policy responses to the constraints facing the power sector have usually attempted to directly address characteristics (iii) and (iv), namely the small number of bidders based on personalized relationships with political insiders and the apparent leakage of procurement rents. Development agencies and partners including the World Bank have insisted on transparent procurement guidelines and bidding procedures. Moreover, political reform and in particular reforms supporting greater political accountability have sought to address characteristic (v), the protracted decision-making that seems to block investments in the sector. The conventional strategy here is to try and make political parties more accountable to the voting public and less responsive to internal factional conflicts. If some of these strategies had been successful, one or more of Arrows 4, 6, 7 or 8 may have been knocked out or significantly weakened with the possibility of setting up positive or virtuous cycles instead of the vicious cycles that otherwise characterize the links between these factors. In addition, general good governance and rule of law reforms have attempted to improve contract enforcement in courts and thereby reduce risk premiums (Arrow 2) and the need for personalized relationships to support informal contracting arrangements (Arrow 3).

However, these reform efforts have not yielded significant results and some of the interdependencies in Figure 7 suggest why this may be the case. Many of the characteristics that have been targeted are dependent rather than independent variables. For instance, the characteristics (iii) and (iv) may appear to be the causes of poor procurement and bidding processes when they are actually the *outcomes* of deeper problems associated with high risk premiums and contracting costs in contexts of political uncertainty. Not surprisingly, good governance reforms in poor countries that have tried to directly tackle these characteristics have generally failed to reduce risk premiums and personalized relationships. Our analysis of why a Weberian rule of law cannot be enforced in the political settlements of developing countries helps to explain why the weak enforcement of particular institutions has to be traced to the way in which institutions are modified because of the rent requirements of powerful organizations[7] A policy intervention is only likely to be effective if it is plausible that its implementation is consistent with the rent-sharing conflicts that will be unleashed within that political settlement. A focus on transparency and procedural reforms can make some difference but it is unlikely to make a difference that is significant enough to alter the interdependent causal links shown in Figure 7. Moreover, the politics of developing countries require the allocation of rents to powerful factions as part of the political process of maintaining political stability and this too militates against the achievement of impersonal rule-based allocative systems (North, et al. 2007; Khan 2010, 2011). It is not surprising therefore that good governance reforms attempted

[7] See the companion paper on *The Political Settlement and its Evolution in Bangladesh*

during the Emergency Caretaker Government of 2007-09 that hoped to achieve greater political accountability within Bangladeshi political parties achieved very disappointing results. Given the features of the macro-political settlement it is not surprising that rule-following procurement and bidding processes have not emerged nor have political parties become more accountable to the extent that they are able to make faster decisions in the public interest.

The implication of these observations is that a focus on directly attacking these characteristics of the problem is unlikely to make a significant difference to observed outcomes even though it may be desirable that pressure for reforms in these areas should continue. The two other points of entry in Figure 7 are more promising but one is more feasible as a point of entry than the other. An excessively ambitious set of expectations for private sector investment in the power sector, characteristic (i) may paradoxically be part of the problem. It sends negative signals to financial analysts looking at the viability of investments over time and the capability of PDB to service its obligations if more than one or two of these investments came to fruition. The outcome is a steep rate of increase in risk premiums with self-fulfilling effects as discussed earlier. But long before this happens, progress on power sector projects slows down and project development is converted into heavily contested games where attention shifts to rent capture at the procurement stage. However, the capacity that would be required within the state to take on a significant share of the expansion of generation capacity within the public sector is not likely to be immediately credible.

This leads to the second point of entry which is by exclusion the most promising route for policy-makers and the political leadership. This is the high financing cost and risk premiums for power sector investments, characteristic (ii). While other political economy factors are difficult to change directly, a significant shift in the cost of financing can alter or weaken some of the interdependencies shown in Figure 7, sufficient for progress to become achievable. One possibility that could be considered is a carefully designed financing facility with a sufficient flow of funds in the pipeline that could significantly lower the cost of financing proposed power generation projects, together with a dedicated governance arrangement for its proper utilization. Clearly, the flow of funds required to make a difference to the cost of finance would have to be orders of magnitude greater than was available in IDCOL or IPFF in the early 2010s. But as a least developed country, Bangladesh could make a bid for such a funding stream through the World Bank, the ADB and other international financial institutions. Such a facility could be structured and administered in a number of different ways but these alternatives are not the subject of our discussion. We will only identify some of the characteristics that such a facility should have in order to achieve an impact in the specific political economy of Bangladesh.

By signalling the availability of a credible flow of funds at an interest rate that can sustain the generation of power at a price that is within the bounds of PDB purchasing capabilities, a number of effects are likely to be set in motion that can be exploited with carefully designed institutional strategies. Clearly, the availability of such a facility would have to be combined with dedicated governance arrangements to ensure that the financing available on beneficial terms was only available for projects that satisfied technical and other governance criteria. The IDCOL experience suggests that this may be achievable and the causal map in our Figure 7 suggests why it may be. By directly intervening to change this characteristic and reducing the financing

costs for important power generation projects under consideration, the intervention can break or weaken the critical arrows 5, 6 and 7 that lead to the emergence of unviable projects or of sustained blocking. First, the lower cost of financing can enable the power project to offer to sell power at a price closer to the final selling price, thereby making the viability of long-term purchase agreements more credible. This can sufficiently reduce the incentive of insiders to focus primarily on the upfront procurement rents and thereby enable dedicated procurement conditions to be enforced to an acceptable degree. This may appear to be an optimistic expectation, but in fact procurement procedures were much better for Meghnaghat 1 when credible financing was available compared to some later cases. This is not surprising because by offering a credible project, financial institutions also have credible leverage for insisting on better procurement conditions.

Secondly, with better procurement conditions and weaker incentives for fixing technical specifications, the adverse selection that results in serious bidders dropping out is less likely to happen. Thirdly, if upfront rents are less in evidence, the intensity of inner-party and bureaucratic lobbying can be expected to decrease, with the focus of interested parties shifting to a greater extent to the long-term rents from the production and distribution of power. Moreover, if the long-term low cost financing makes the project under consideration viable, it is more likely that other projects will follow without PDB becoming insolvent. The prospect of successive projects is likely to reduce the intensity of zero-sum conflicts and with a sufficiently large pipeline of credible projects this could prevent the blocking of projects by disappointed factions. None of these potentially beneficial results are likely to automatically follow without considerable attention being given to the governance design of any facility of this type in the future. But our analysis suggests that without a substantial facility which can promise to reduce the cost of financing and contribute to improving the viability of investments in the power generation sector, direct interventions targeting adverse characteristics of this sector are likely to fail.

The governance structure of the Indian Power Finance Corporation (PFC) is not likely to be replicable in Bangladesh because the PFC benefits from the checks and balances provided by India’s federal structure. As a central government financial organization, the PFC is answerable to the central government, while most power generation projects that it finances come under state governments. This, together with strong professional bureaucratic leadership has ensured that PFC financing does not get excessively captured by inefficient projects, such as ones where the prime interest is in procurement rents. In the context of a smaller country like Bangladesh, more attention would have to be given to the governance of a similar financial organization to ensure that credit allocation was not going to be captured by clients of the ruling party even if they are unable to deliver efficient projects. On the other hand, Bangladesh has the advantage that the private sector is already a significant player in power generation. Potential financing for power generation at preferential interest rates would not be targeted towards the public sector alone, but would be open for the private sector to bid. It is possible to imagine how a governance structure could be constructed which combined access to funds at preferential rates with strong requirements for competitive bidding.

Since the underlying finances for the financing instrument would almost certainly come from international financial institutions like the World Bank or the ADB, these

organizations could insist on strict governance of procurement and other conditions for these loans. It is likely that combination of a reduction of incentives for procurement rents, the plausible provision of profitable investment opportunities to investors and pressure from the business community and international agencies on the ruling coalition could allow the creation of a limited bureaucratic governance agency with external assistance that could ensure an acceptable use of this funding. In particular, the availability of capital at reasonable prices would also attract serious bidders both domestic and foreign, who would find the overall contractual context more credible in the presence of these facilities. Despite its differences, the Indian experience does show that by combining viable financing with appropriate institutions, power sector investments are possible even in competitive clientelist settings. A focus on developing the governance structures for financing power generation at preferential rates in Bangladesh is therefore likely to be a fruitful point of entry for cracking some of the political economy constraints facing investments in this vital sector.

We surmise that some of these conditions were in place when the first two successful IPPs went through. A combination of conditions created virtuous feedbacks in the links identified in Figure 7 for both the Meghnaghat 1 and Haripur projects. The scale of the projected role of IPPs was initially relatively small, gas supplies were promising and the cost of financing was kept low as a result of the role of the IFIs as discussed earlier. This combination of conditions lowered the risk perception of private financiers and further contributed to the low selling price offered by the IPP operators in these projects. The viability of the projects ensured that adverse selection or the focus on procurement rents did not happen to the extent that blighted subsequent projects. One implication of our political economy analysis is that if the cost of capital has to be kept low and if this requires negotiating a financial facility at concessionary rates and appropriate governance conditions, there is likely to be a ceiling on the pace of expansion set by the magnitude of the facility available. We would argue that if the achievement of a lower cost of capital requires greater modesty in the rate at which the supply of power is projected to increase in Bangladesh it may be a price well worth paying. Paradoxically, the actual rate of increase in the power supply may be higher if the private financing that is called upon and the rate of subsidy that is implied for PDB is reduced to a far more realistic level.

6. Conclusion

This paper applies the framework of political settlements to look at the growth and performance of three different sectors in contemporary Bangladesh. It shows that our understanding of economic policy and institutional reform can be augmented by locating this analysis within a broader framework of evolving political settlements and the limits they place on the implementation and effective management of particular institutional arrangements. Institutional innovations are important for overcoming particular contractual (market) failures and in general, the problems of financing learning-by-doing constitute an important area of contractual failures in developing countries.

We looked at the major success story of Bangladesh, the garments sector, which took off in the context of clientelistic authoritarianism and a favourable international rent environment that Bangladesh was lucky enough to be able to exploit. It had just the

right level of organizational capabilities amongst a broad-based group of potential entrepreneurs, a ruling coalition that had the self-interest and the political capability to enforce a small number of critical institutional innovations and a leading entrepreneur in Bangladesh and a collaborator in South Korea who both had the right incentive structure to finance and then put in very high levels of effort in learning. The lessons that we derive from this experience are that market opportunities are important but insufficient for explaining success or for creating the conditions for the next line of successful industries. Financing instruments that can help to finance learning-by-doing are critical but they have to be designed such that the incentives for high levels of effort are maintained given the characteristics of the political settlement.

A second sector that is emergent in Bangladesh and is likely to play a vitally important role in the future is the nascent electronics industry. This began its takeoff when the political settlement had already transformed into a competitive clientelist one and it did not enjoy the accidental international rent support of the type that the garments industry enjoyed under the MFA. Success here depended on another fortunate 'accident', the presence of a pioneering nationalist company that took the risk to single-handedly finance a significant amount of the initial learning-by-doing in refrigerator manufacturing because it wanted to build national productive capabilities. To a large extent, this forced a competitive clientelist government to become a follower. The government supported its success with policies that then helped the company to consolidate some of its investments and to trigger a number of traders and assemblers to move into manufacturing because their import-based businesses, particularly in refrigerators, were no longer viable in some market segments. Our analysis here shows that even in an overall context that is fairly unfavourable, learning-by-doing was still being financed in some sectors. An analysis of the prospects of the electronics industry in Bangladesh suggests that it should be possible to design financing instruments to assist the development of manufacturing of selected components as a feasible long-term strategy.

Finally we looked at the very serious crisis in power generation and the failure of successive governments to increase the generation of power in a sustainable and cost-effective way. Here the political settlement has a different role to play in explaining these failures. The interdependent characteristics of the failure in the power sector have aspects which seem to fit a standard explanation based on the absence of 'good governance'. The lack of transparency in the allocation of contracts, government corruption and the lack of accountability can appear to explain the failure to get serious bids. As a description of the problem this is not wrong, but many of these characteristics are themselves dependent variables which have to be located within the operation of a particular political settlement and a specific set of economic features of the power sector in Bangladesh. Our analysis explains both why the standard good governance reforms have had a very limited effect on the power sector and helps to identify a possible entry point for reform. The availability of moderately priced financing, ultimately sourced from international financial institutions, with dedicated governance capabilities could create a mix of incentives and opportunities that may allow its operation within a political settlement that continues to require rents for political allocation. The example of the more successful Indian power sector, though different in important respects, suggests that it is important to explore these alternative approaches to mitigating some of the constraints in the power sector.

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